# IRON & COAL

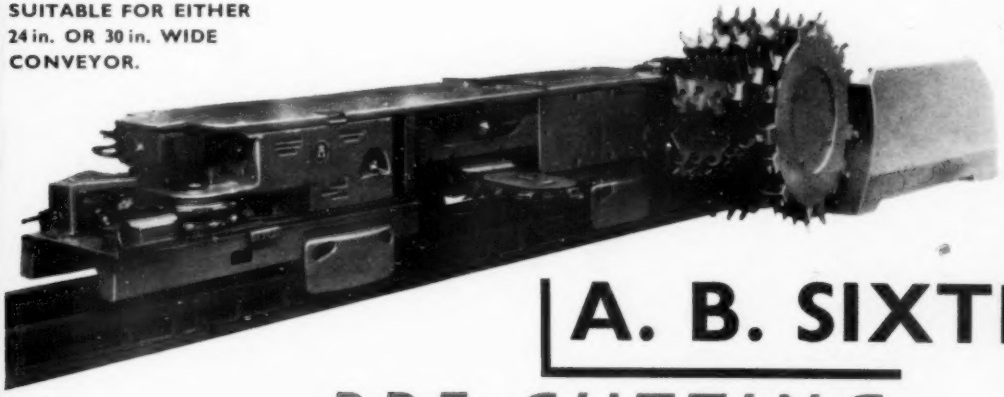
THE IRON AND COAL TRADES' REVIEW

VOL. 182 No. 4,935 — Offices: John Adam House, 17-19, John Adam Street, London, W.C.2 — LONDON: FRIDAY, MARCH 17, 1961 — Registered as a Newspaper. Single copies 1s. By post 1/4. Ann. Subn.: 52s. (Abroad 60s.)



## *Improve Coal sizing, Output and Productivity*

**HYDRAULIC HAULAGE WITH AUTO CONTROL. 100 OR 125 H.P. CONTINUOUSLY RATED WATER-COOLED MOTOR. SIDE CONTROLS. SUITABLE FOR EITHER 24 in. OR 30 in. WIDE CONVEYOR.**



**WITH THE**

## A. B. SIXTEEN

## *PRE-CUTTING*

## ANDERTON SHEARER-LOADER

**WITH A.B. BUCKET DRUM ON TAPERED HUB**

Illustration shows the HAULAGE END UNDER-CUTTING version. Other arrangements available are:—

Fixed Overcut.
Ranging Overcut.
Combined Overcut and Undercut.

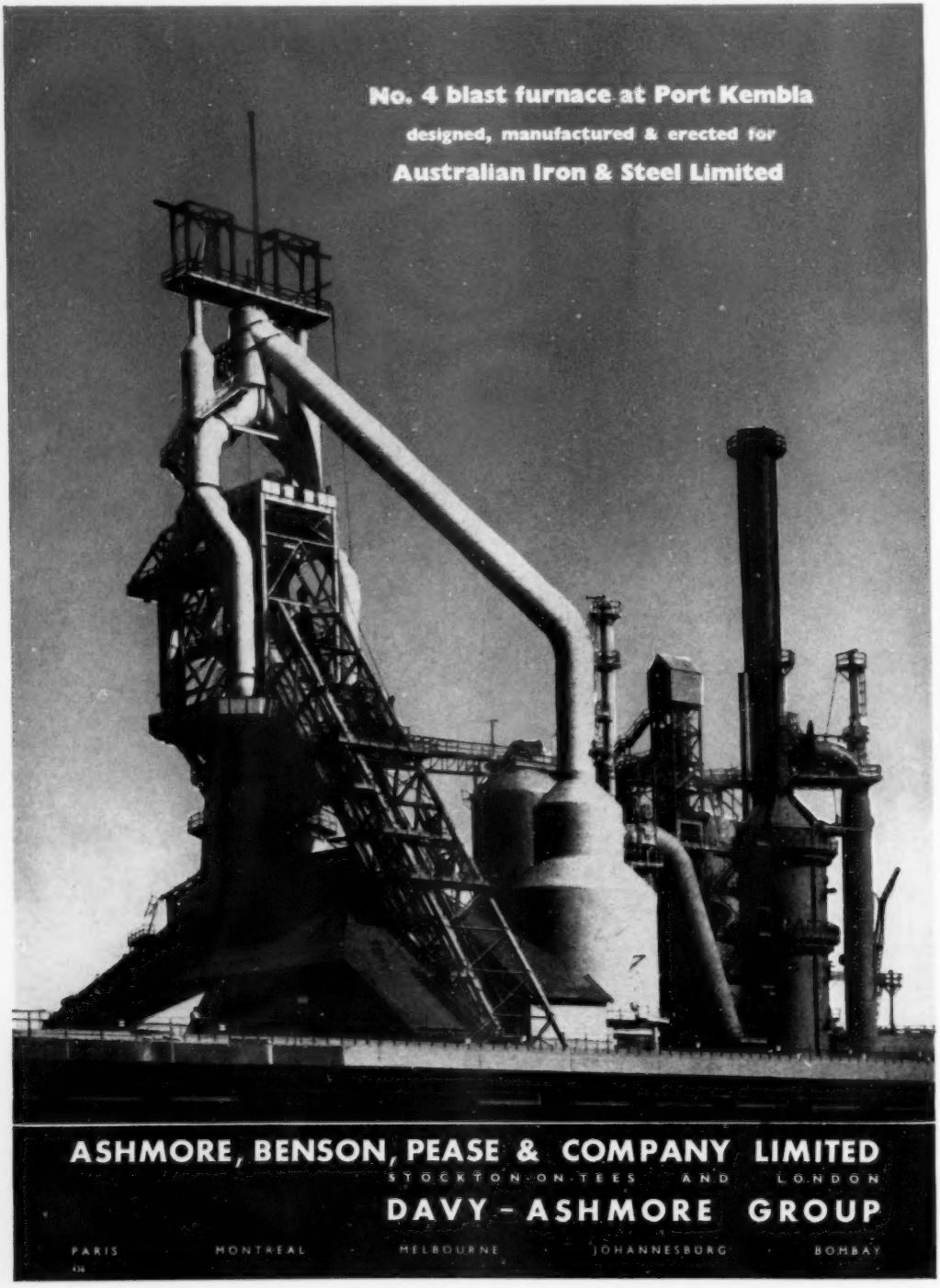
*PIONEERS IN POWER-LOADING*

**ANDERSON, BOYES & CO. LTD**

**HEAD OFFICE: FLEMINGTON ELECTRICAL WORKS, MOTHERWELL**

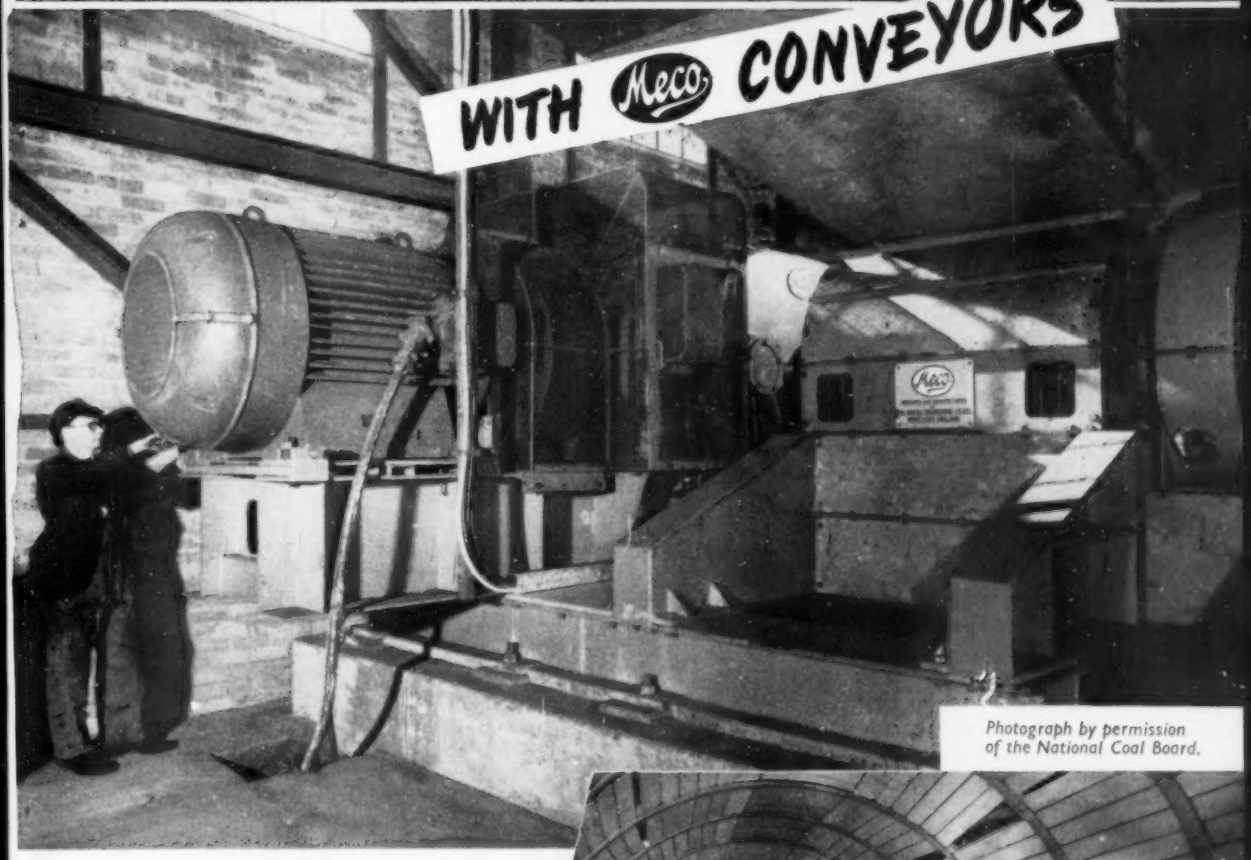
London Office: 25 Victoria Street, S.W.1

Branches at Gateshead, Rotherham, Cardiff and Glenrothes (Fife).
Represented throughout the coalfields of the world.

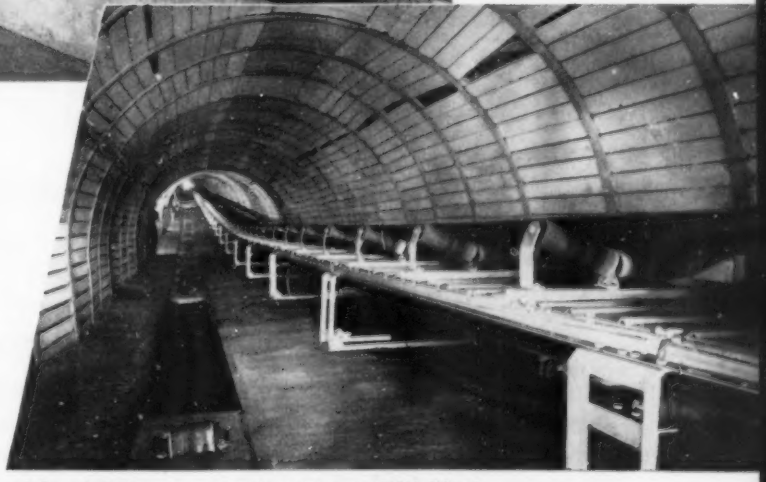

No. 4 blast furnace at Port Kembla
designed, manufactured & erected for
Australian Iron & Steel Limited
ASHMORE, BENSON, PEASE & COMPANY LIMITED
STOCKTON-ON-TEES AND LONDON
DAVY-ASHMORE GROUP
PARIS
MONTREAL
MELBOURNE
JOHANNESBURG
BOMBAY

# MAXIMUM ECONOMY IN DRIFT TRANSPORT

## WITH Meco CONVEYORS



*Photograph by permission of the National Coal Board.*



The top illustration shows a Meco power pack rated at 45,000 ft. lbs. used as a single drive for a double drum belt conveyor driving head. The conveyor is 2,146 ft. long with a lift of 478 ft. and carries 2,000 tons/day run-of-mine coal. The H.P. rating is 300 at 400 ft./min.

MECO STANDARD POWER PACKS, SINGLY OR IN COMBINATION, CAN BE BUILT UP TO THE MAXIMUM POWER OF ANY AVAILABLE HIGH DUTY CONVEYOR BELTING.

**THE MINING ENGINEERING CO. LTD.,**

**MECO WORKS, WORCESTER, ENGLAND.**

Telephone: Worcester 22291 (7 lines).
Telegrams: MECO Worcester.
London Office: 50 Pall Mall, London, S.W.1.
Telephone: Trafalgar 4686/7.
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L.P. 211—110

# Better lamps—better lamprooms

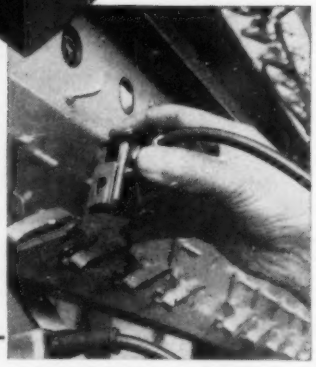
WITH THE NEW

## PATTERSON CAP LAMPS

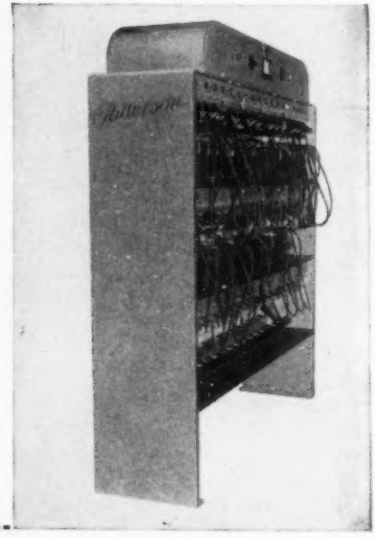
### AND CHARGING RACK

Improved light output and long trouble-free life are features of the new Patterson cap lamps. Fitted with high grade reflectors, silver tipped contacts, and Exide lead-acid batteries, they work brilliantly without a flicker.

They are automatically kept at the peak of efficiency by the attractive new Patterson charging rack. This is based on the headpiece key-type charging system and is designed to increase lamproom efficiency and reduce lamproom labour.



*The type SS 3 self-servicing cap lamp and headpiece. It fits any standard headpiece key-type charging equipment or can be used with the new Patterson charging rack.*



*To:* PATTERSON LAMPS (1953) LIMITED
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*Please send me further details of your new cap lamp and charging rack.*

NAME_____

ADDRESS_____

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TGA P150A

# ARE YOU USING FENAPLAST

HEAVY DIAMOND TYPE

CONVEYOR BELTING FOR MAIN GATES & TRUNKS

NOTE THESE IMPORTANT ADVANTAGES:

- FENAPLAST HEAVY DIAMOND BELT STRENGTH EXCEEDS 6-PLY 42 oz COTTON.
- ALL-NYLON CONSTRUCTION eliminates any possibility of tearing.
- COMPLETE PLASTIC IMPREGNATION ensures immunity to wet conditions.
- SOLID WOVEN NYLON CARCASS means that there is no separation problem.

SPECIFY FENAPLAST HEAVY DIAMOND

## FOR THE ROUGH TOUGH JOBS

| RANGE OF DIAMOND TYPE BELTINGS AVAILABLE | | | | |
|---|---|---|---|---|
| N.C.B. APPROVAL NO. | 158 | 149 | 158 | 149 |
| TYPE | DIAMOND | DOUBLE DIAMOND | HEAVY DIAMOND | EXTRA HEAVY DIAMOND |
| BREAKING LOAD MINIMUM PER INCH WIDTH | 2000 LB | 2500 LB | 3000 LB | 4000 LB |
| THICKNESS | 8 mm | 8 mm | 8 mm | 9 mm |

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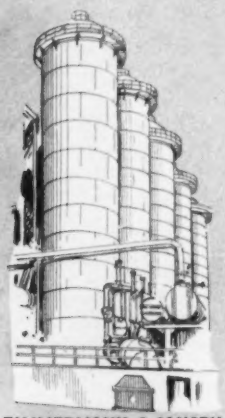
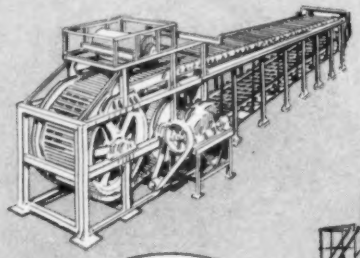
*FACTORIES OVERSEAS IN AUSTRALIA, INDIA AND SOUTH AFRICA*

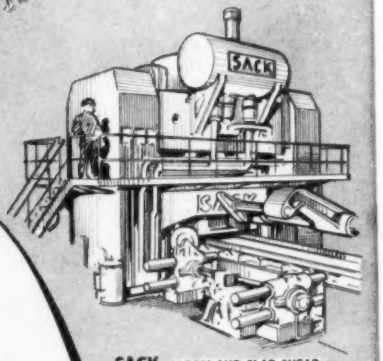
LARGEST MAKERS OF V-BELT DRIVES IN THE COMMONWEALTH



ZIMMERMANN & JANSEN
AUTOMATIC STOVE CONTROL



LURGI SINTERING MACHINE




SACK BLOOM AND SLAB SHEAR

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SUPPLIED BY

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LONDON, S.W.1
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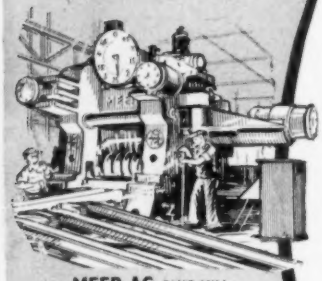
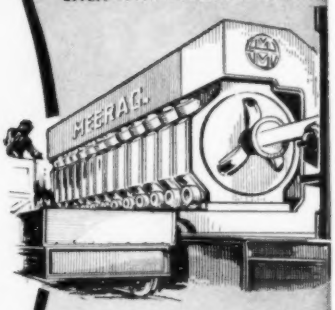
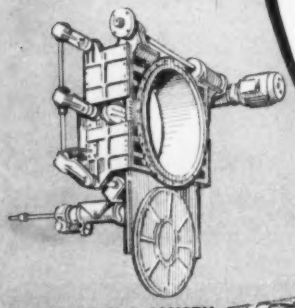
(3 lines)



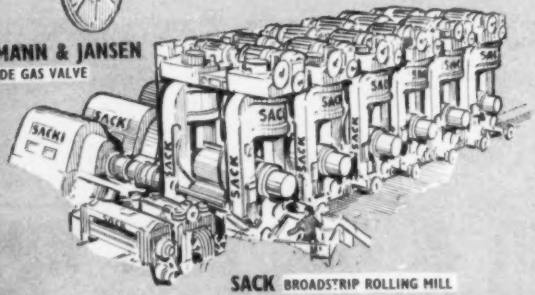
MEER AG PLUG MILL



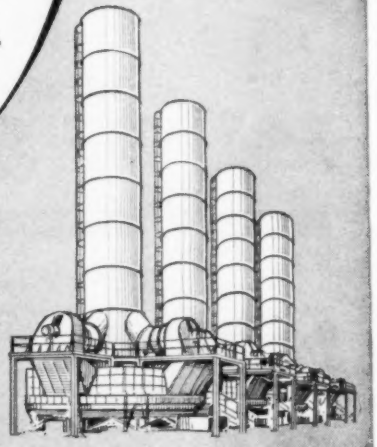

MEER AG STRETCH REDUCING MILL



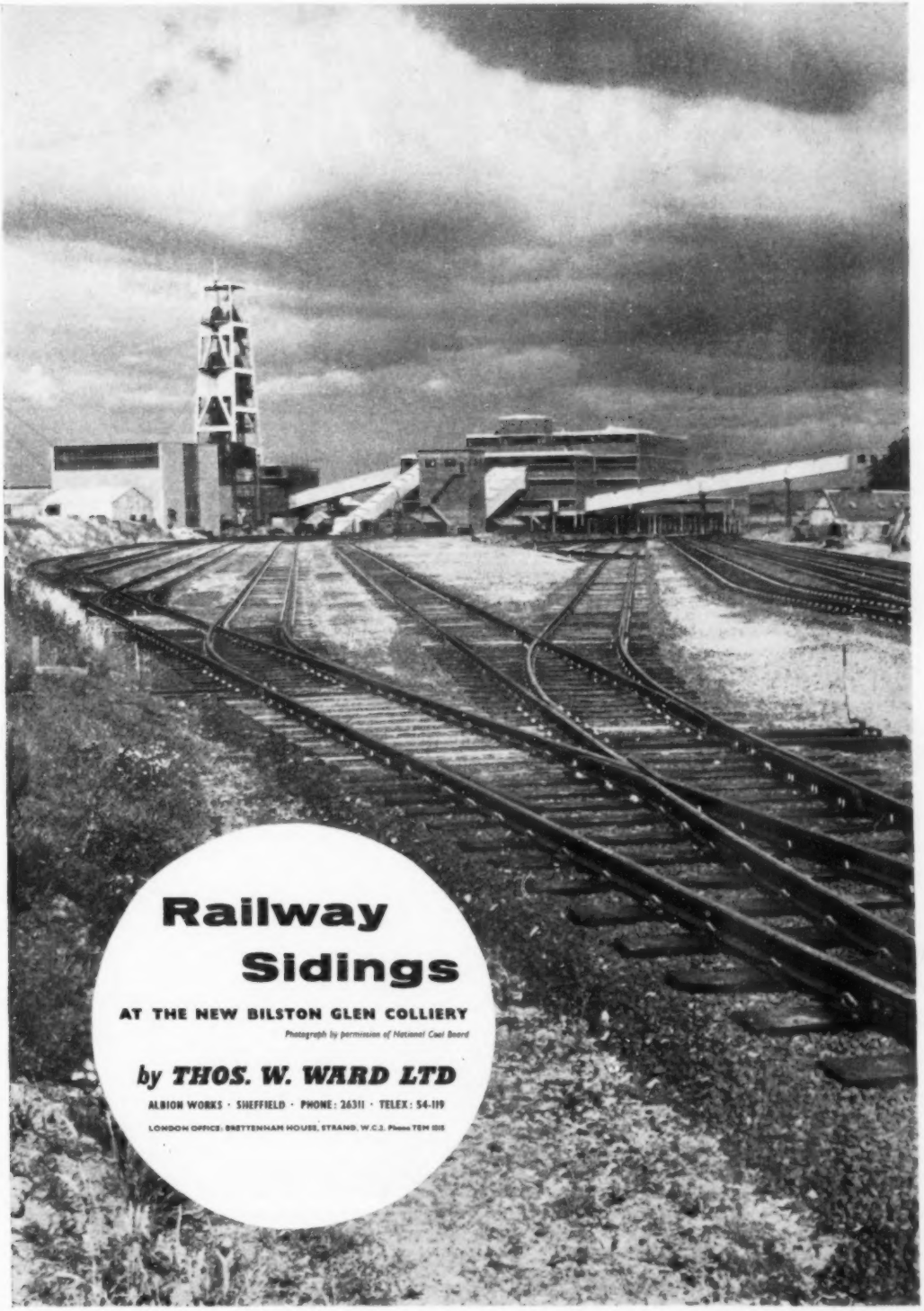
ZIMMERMANN & JANSEN
CRUDE GAS VALVE




SACK BROADSTRIP ROLLING MILL



LURGI SINTER COOLER


Railway
Sidings
AT THE NEW BILSTON GLEN COLLIERY
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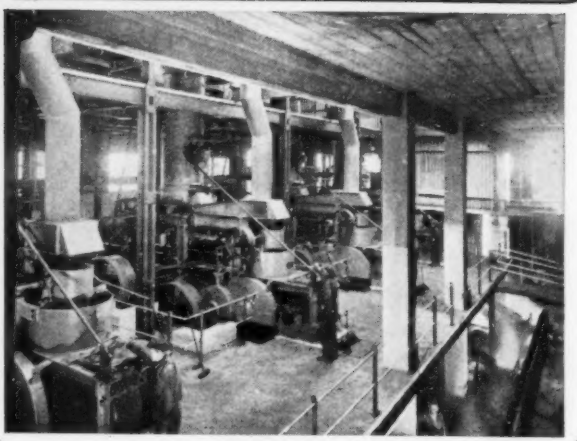

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MIXERS AND MEASURERS.

DISINTEGRATORS.

OVOID ROLLS.

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COMPLETE PLANTS FOR BRIQUETTING SMALL COAL, COKE, IRON, COPPER AND OTHER ORES.

YOUR OWN MATERIALS TESTED FOR SUITABILITY FOR BRIQUETTING AT OUR OWN BRIQUETTE WORKS IN LEEDS.

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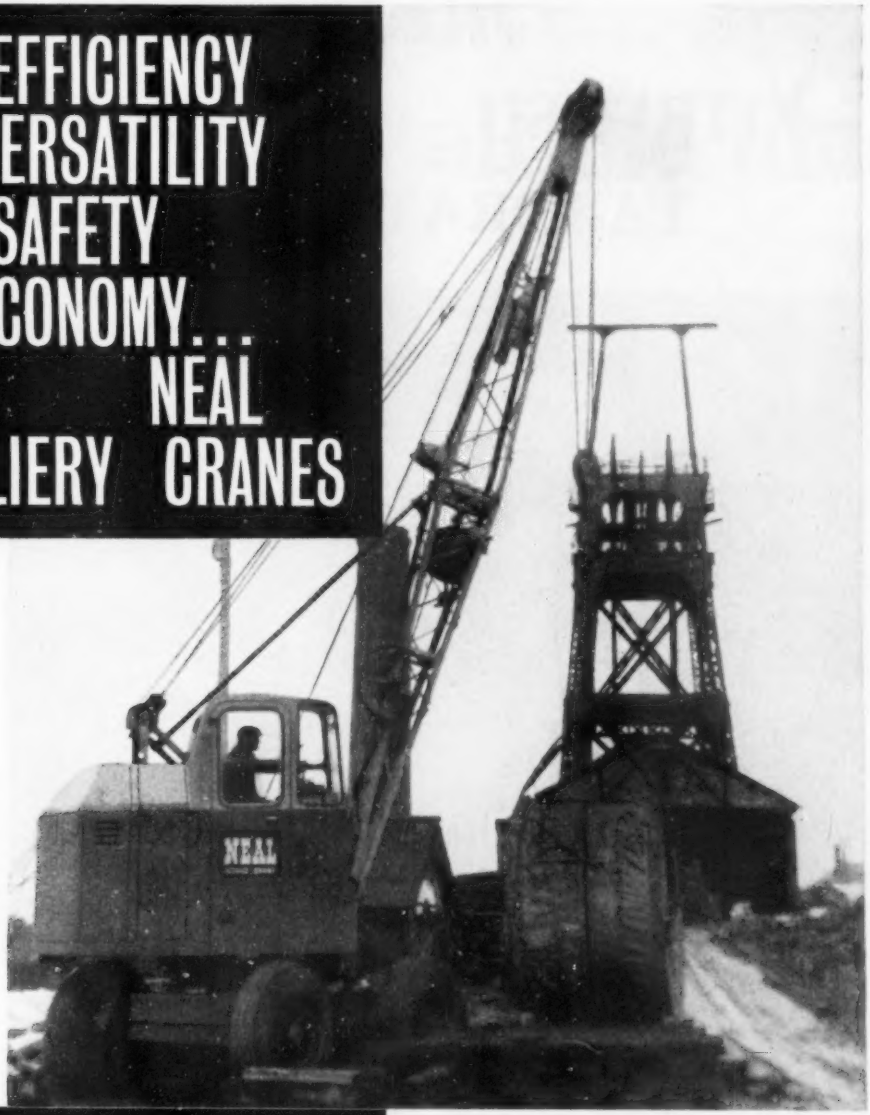


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SALES & SERVICE: LONDON, BRISTOL, BIRMINGHAM, MANCHESTER, LEEDS, NEWCASTLE, GLASGOW

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# VITREOSIL* PURE FUSED SILICA LABORATORY WARE

- Highly resistant to thermal shock.
- Completely inert to all acids except hydrofluoric.
- Standard equipment for ashing determinations.
- For repeated use up to 1050° C.

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# Peak performance... all the time

*with the* **MOUNTAINEER** *and* **SHERPA Mk. II**

All-wheel-drive and powered steering enables the Scammell 4 x 4 Mountaineer to haul its 8/10 cu. yd. load over the very worst of site conditions. The Leyland 0.680 diesel engine and 6-speed gearbox enable it to climb gradients of 1 in 3, shifting 13 tons. Its rugged construction and 'go-anywhere' ability combine to make the Mountaineer an all-weather, round-the-clock proposition.

The 4 x 2 heavy-duty Sherpa Mk. II, new addition to the range of Scammell Dump Trucks can tackle most *arduous conditions* with ease. Economically moves full 9/11 cu. yd. loads. Its 150 h.p. diesel engine, 6-speed constant mesh gearbox, powered steering and a tipping cycle that incorporates full power return, are just some features of this profit-winning vehicle. Fully descriptive leaflet on request.

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*for*

**SCAMMELL**

**DUMP TRUCKS**

*SOLE CONCESSIONAIRES IN THE UNITED KINGDOM*

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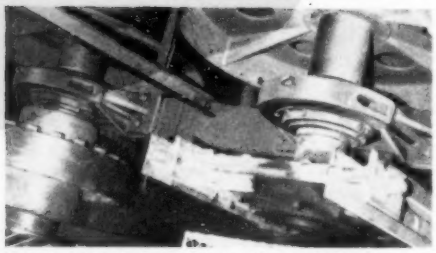
**SHILDON, (Co. Durham) Tel. 261.**

# Coopers on the surface... and Coopers underground...



The use of 10" Heavy Series Cooper Bearings on this heavy duty conveyor gives a compact layout – with excellent accessibility.

**Wherever** you put a Cooper Split Roller Bearing to work, it *saves* **work. Saves** work for the designer — a Cooper cuts out all the worry about "how to get the bearings in". Saves work in assembly — a Cooper is simply *positioned* on its shaft with no need to disturb adjacent gears, couplings etc. Saves work in maintenance — you can inspect the actual rolling surfaces without disturbing the shaft.

These remarkable Split Roller Bearings have been earning an enviable reputation for reliability for over 50 years, in thousands of plants throughout the world. They are manufactured in 3 series, Medium, Heavy and Extra Heavy in sizes from 1¼" (30 mm) bore to 30" (750 mm) bore; complete with sturdy self-aligning Housings and Pedestals. Prices? Competitive. Delivery? Rapid — many sizes ex-stock. American equivalents, large Roller Bearings (both split and solid) and large Ball Bearings are also manufactured to your requirements.

If you would like to discuss Cooper Roller Bearings there is a team of District Engineers in this country at your service — and agents in 54 countries overseas. Perhaps your first step is to send for our illustrated catalogue

**COOPER** ROLLER BEARINGS

split right down to the shaft

REGISTERED TRADE MARK

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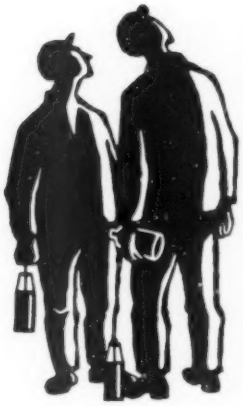
**PROBLEM:** Economical Working of Seams under Difficult Conditions

**SOLUTION:** **Westfalia Reisshakenhobel**



**The outstanding feature**

The plough chains are enclosed and run on the goaf side of the conveyor.

**Advantages**

Low design of the plough body.

Narrow plough track as no guide tubes are required.

Increased effectiveness of the plough due to the chain pulling force operating on a small number of bits.

Less breakage and pulverisation of coal in the plough track which is free of chains.

Excellent adaptability of the flexible plough body to uneven floors.

Installation of the driving units on the goaf side of the conveyor.

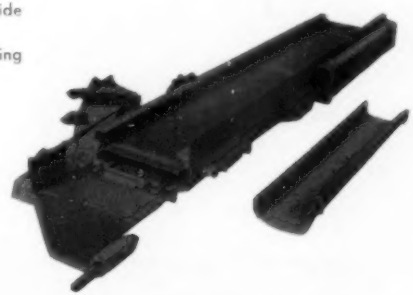
Reduced lateral movement of the conveyor during ploughing.

**Particularly suitable for**

thin seams,

seams associated with difficult strata,

seams with gradients in favour of the load.

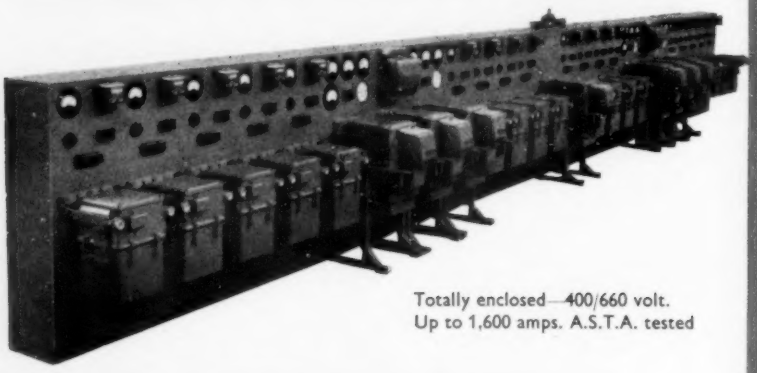


UNDERGROUND MINING MACHINERY LTD.

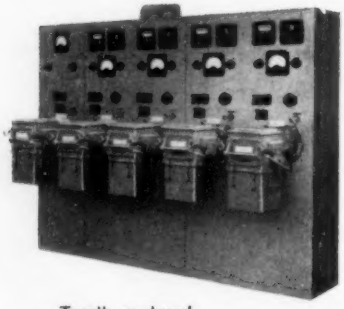
Agents: **Dollery & Palmer Ltd.,** 54, Victoria Street, London, S.W. 1 and Lydgate Lane, Sheffield, 10

# POWER DISTRIBUTION

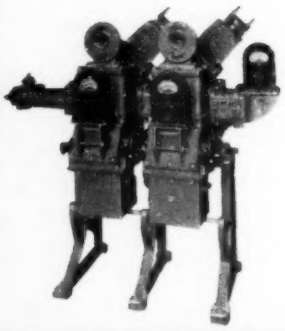
## BY OIL-IMMERSED CIRCUIT-BREAKERS



Totally enclosed—400/660 volt.
Up to 1,600 amps. A.S.T.A. tested



Totally enclosed
3,300 volt—up to 400 amps.



Flameproof
400/660 volts—up to 400 amps.
3,300 volts—up to 200 amps.

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KIRKINTILLOCH, GLASGOW

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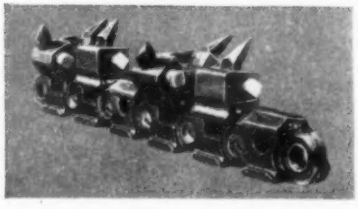
# SuperKerf

## the latest in a fine series of Coal Cutter Chains

The Hoy SuperKerf Chain is the latest development of the well-known Multipic principle. Within the same short pitch of $3\frac{1}{2}''$, new features include :—

**End-entry setscrews.**
**Double and single boxes.**
**Massive D-section joint.**
**New profile for high gum-carrying capacity.**

The SuperKerf Chain will fit existing Multipic and Linkpic Jibs and Sprockets, Double and Triple Jibs and many others.



*Write for SuperKerf broadsheet.*

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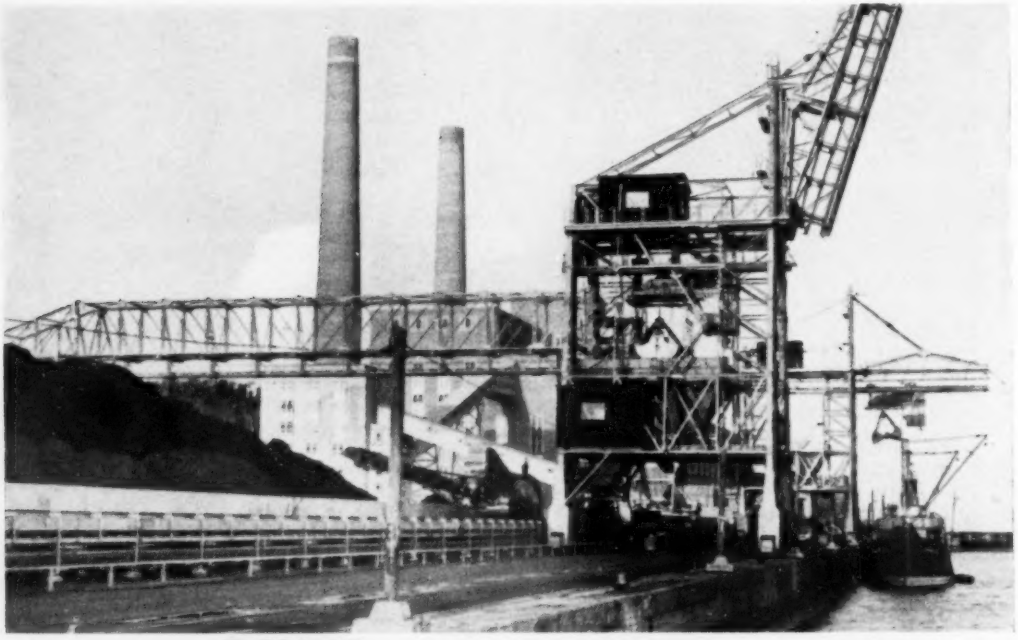
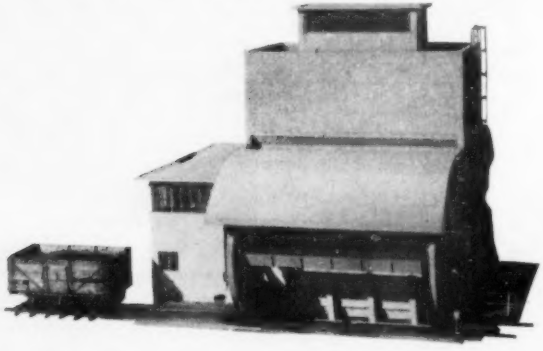


# BULK HANDLING PLANT by STRACHAN & HENSHAW

The coal handling plant at the Portishead power station of the Central Electricity Generating Board incorporates: two Ship Unloaders of 150 t.p.h. each: one Storage and Reclaiming Transporter (260 t.p.h.) two Rotaside Wagon Tipplers (with S & H patented Dust Trapping System). Wagon marshalling plant etc. One of the dust trapping Wagon Tipplers is shown below.



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**STRACHAN & HENSHAW LTD**

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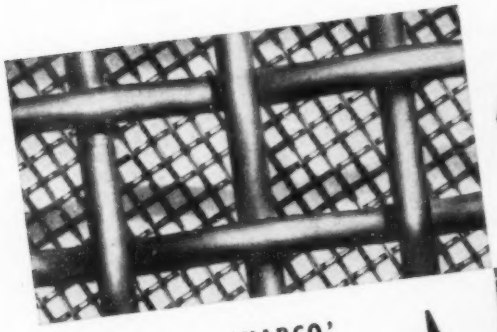
LONDON · GLASGOW · JOHANNESBURG · MELBOURNE · CALCUTTA · CHRISTCHURCH (N.Z.)

# 3 THINGS TO REMEMBER

WHEN ORDERING SCREENS AND FILTERS

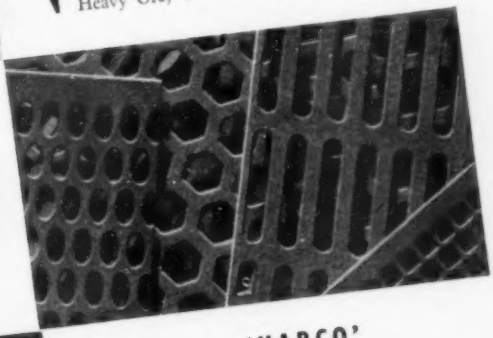


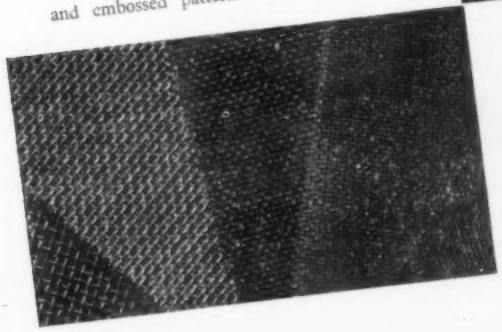
**1 HARVEY HIGH CARBON STEEL WIRE SCREENS**

Woven from steel made to Harvey's own analysis, these screens offer the maximum resistance to abrasion and fracture from fatigue. Highly recommended for use with all grades of Coal, Stone, Heavy Ore, Granite, Sand and Gravel.

**2 'HARCO' PERFORATED METALS**

Highest quality metals with clean and accurate perforations ensure long life and trouble-free service. A wide range of sizes and patterns is available, including many for specialised purposes. Ornamental and embossed patterns also supplied.





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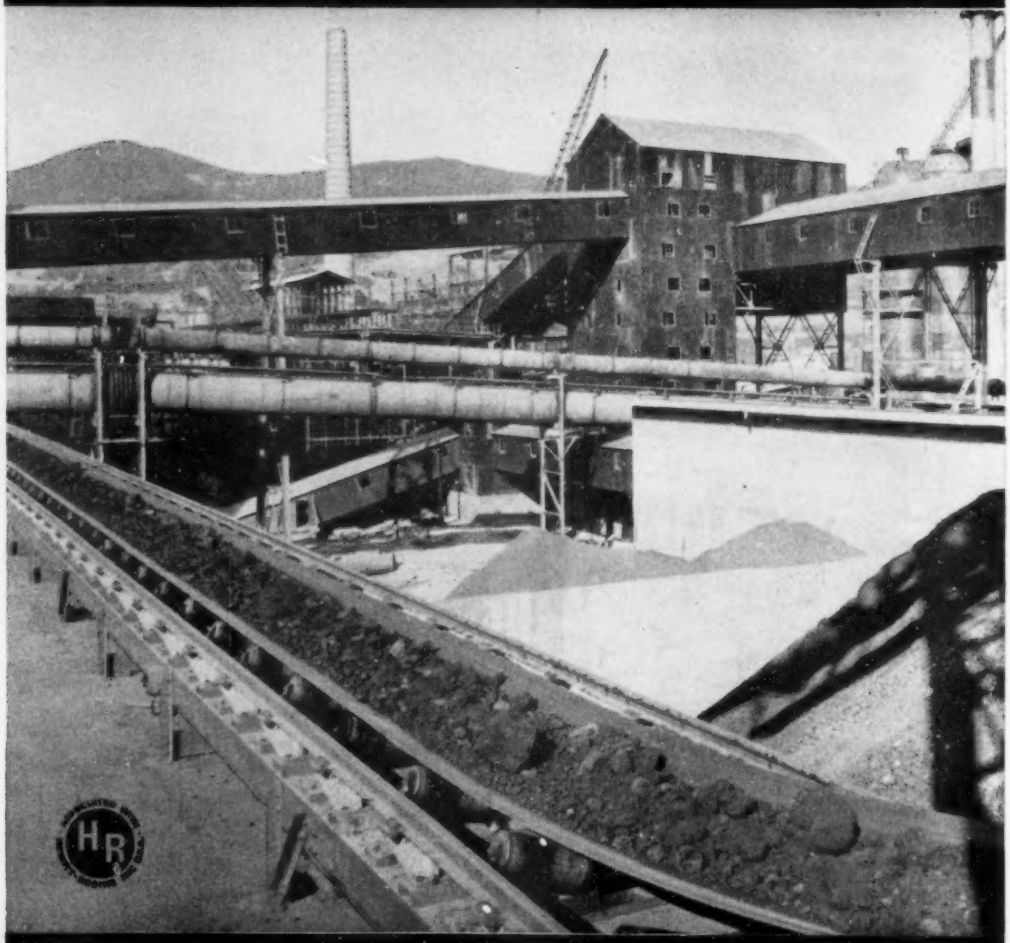

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**Rust preventives:**
Most of the Croda range are based on lanolin called the finest organic metal protective compound by the National Physical Laboratory. As manufacturers of lanolin, Croda can offer rust preventives at highly competitive prices.

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not only removes all rust from ferrous metals but also in the same operation gives the metal a rust preventive coating.

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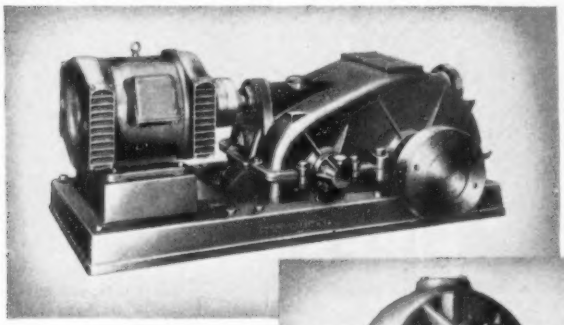

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*(shown above)*
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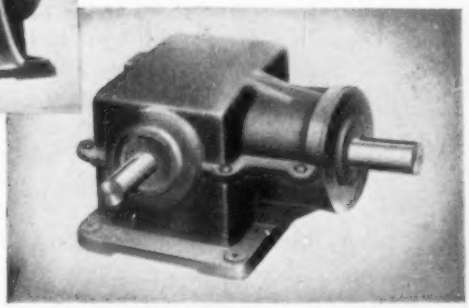

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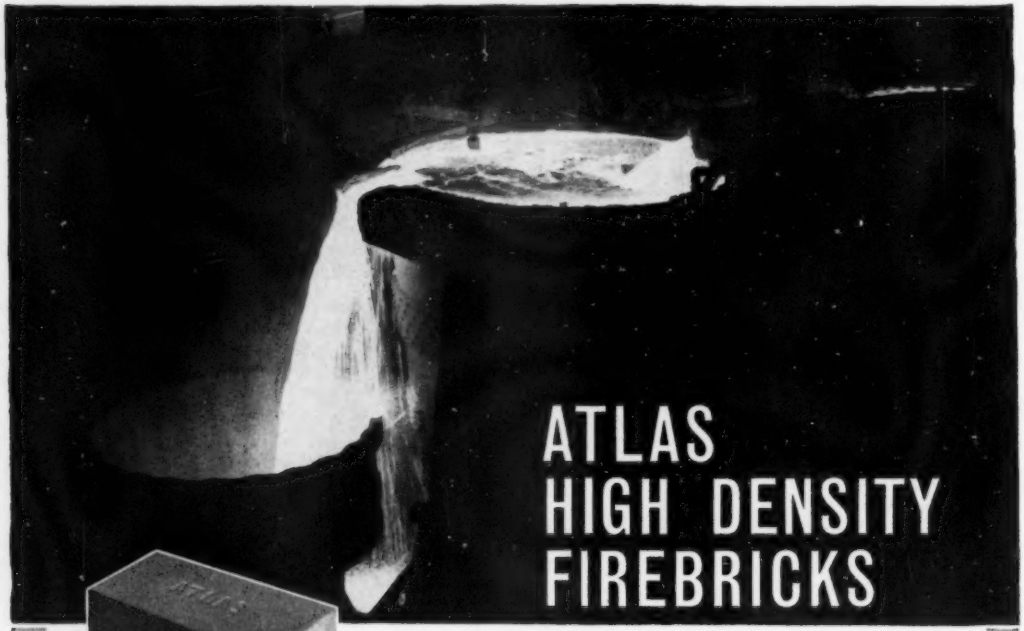


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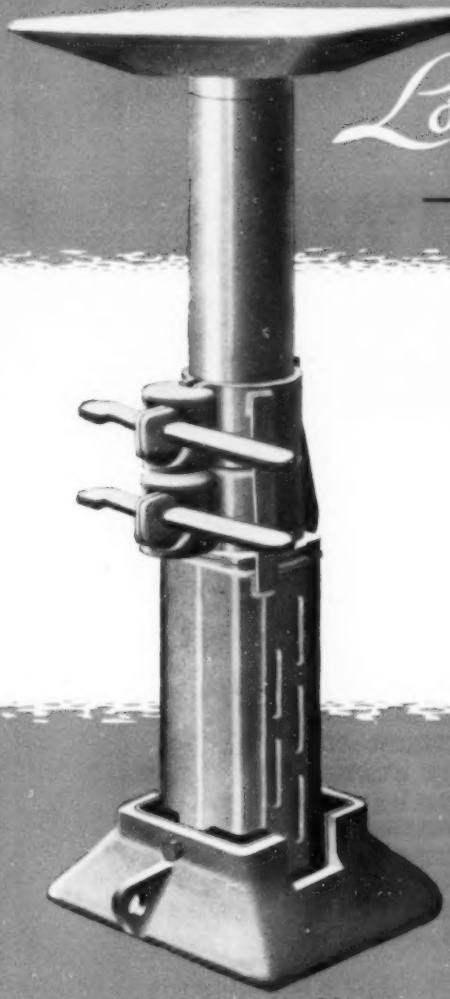

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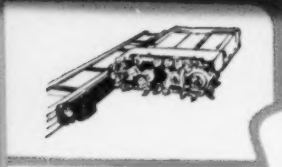
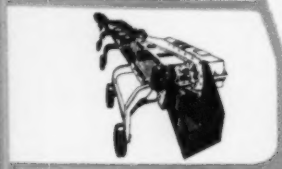

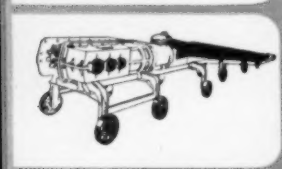
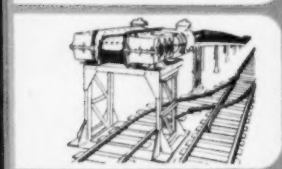
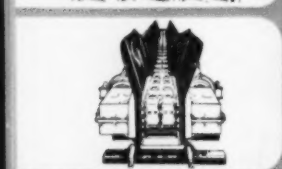
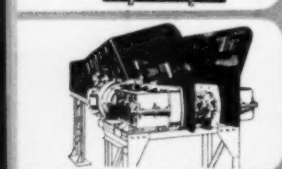
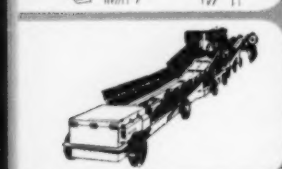
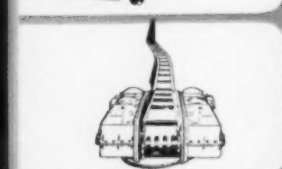

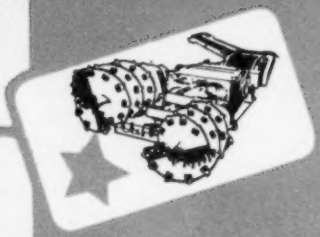

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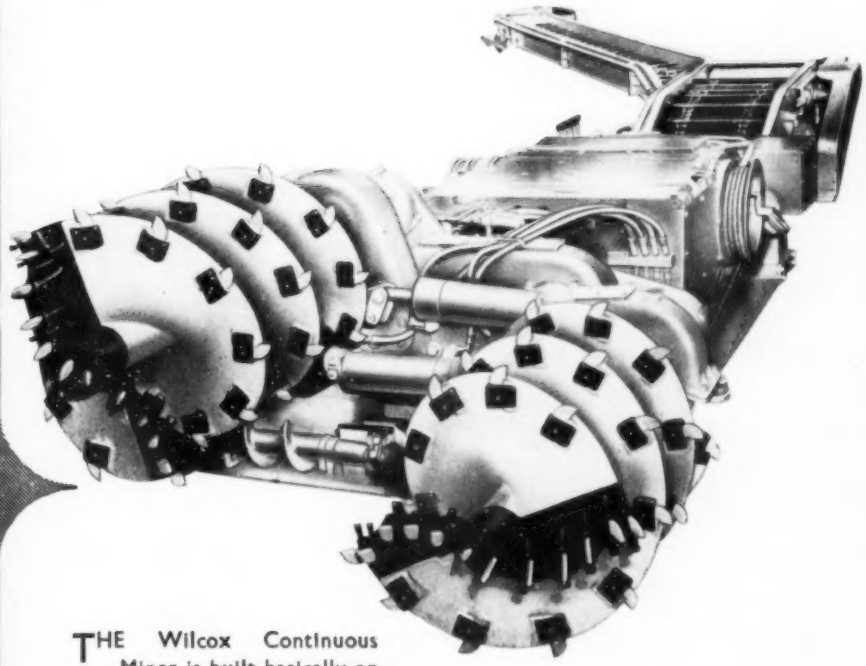
# *CONTINUOUS MINER*



THE Wilcox Continuous Miner is built basically on a shortwall coal cutting machine chassis with two augers 41in. long and varying in diameter from 22in. upwards according to seam thickness. Each is equipped with carbide cutting picks on both front cutting edges and auger scrolls. The augers are driven through reduction gearing from the motor and rotate in opposite directions. Hydraulic controls are fitted as an integral part to both machine and conveyor.

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- **Can produce up to 300 tons per shift with two 3 men crews at the working face.**
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***MORE TONS PER MAN AT LESS COST PER TON***

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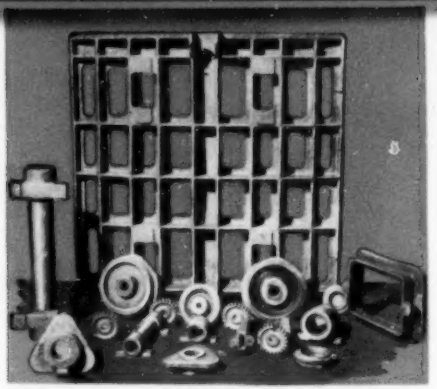
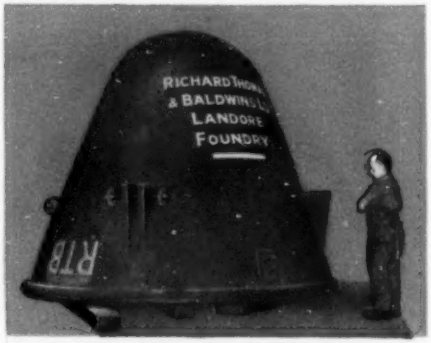


*General iron castings from Landore Foundry & Engineering Works, Swansea. (In background is a 6 ft. square frame.)*

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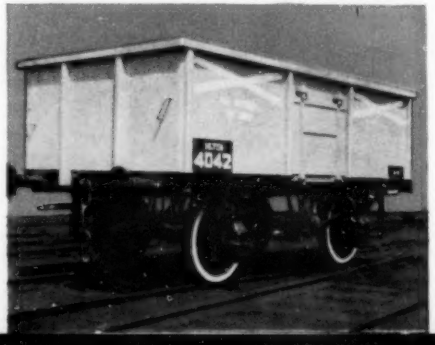

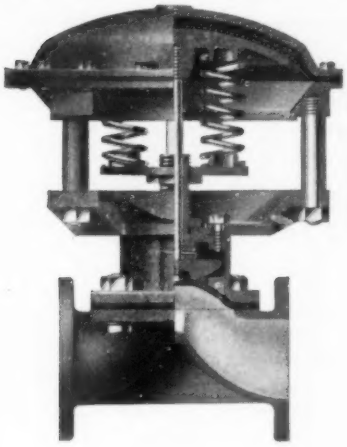

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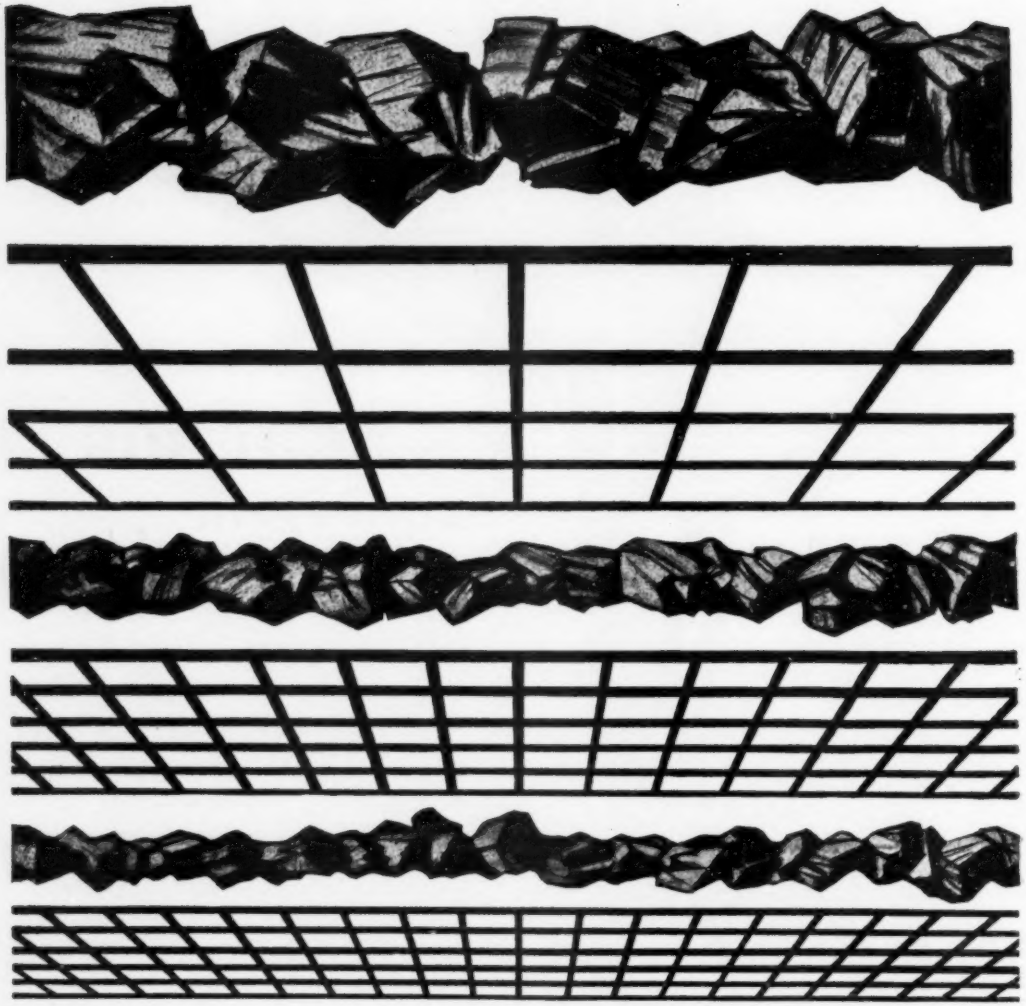

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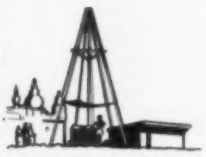

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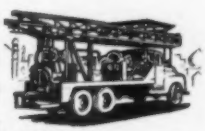

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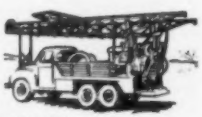

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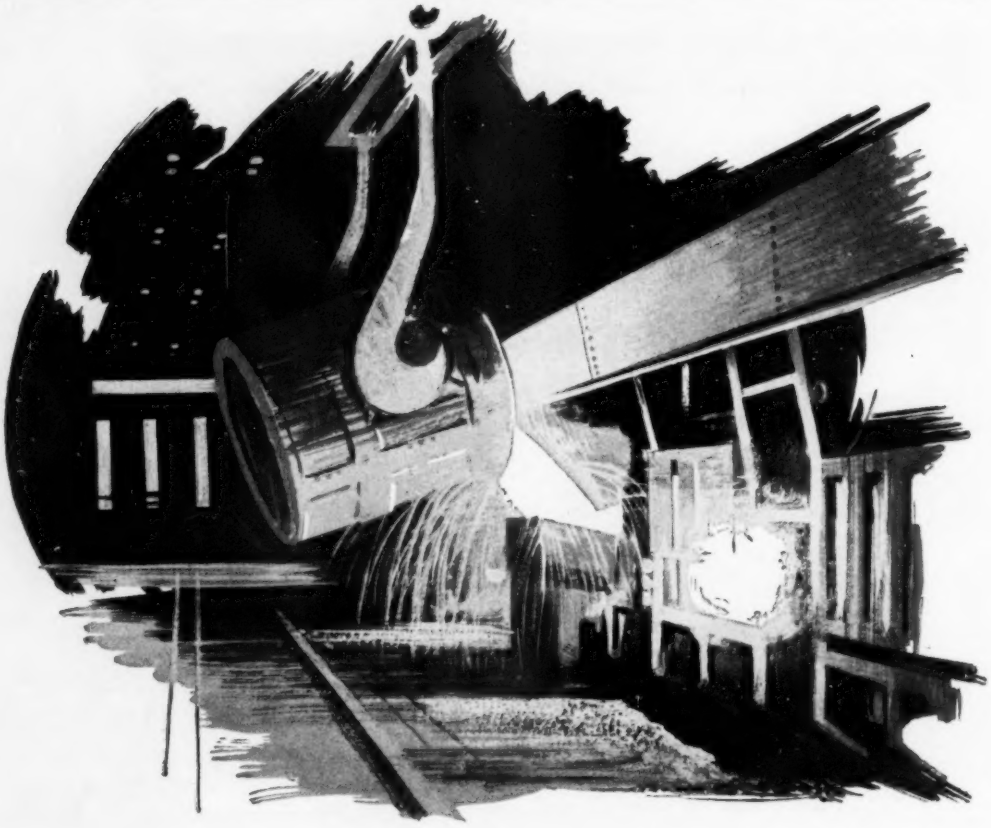

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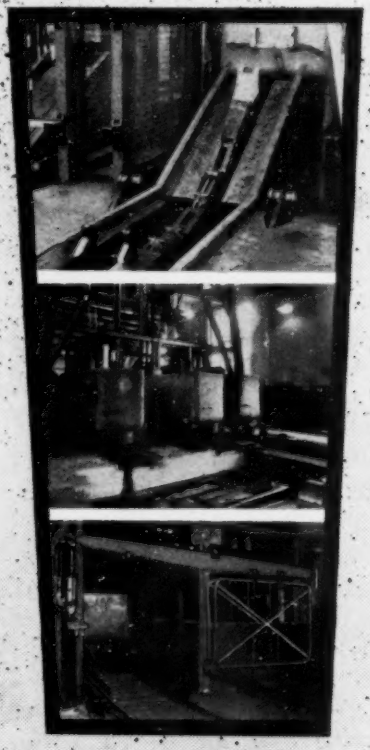

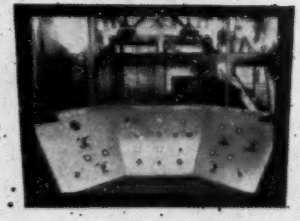

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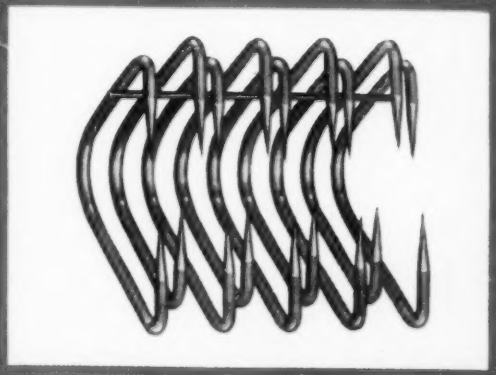

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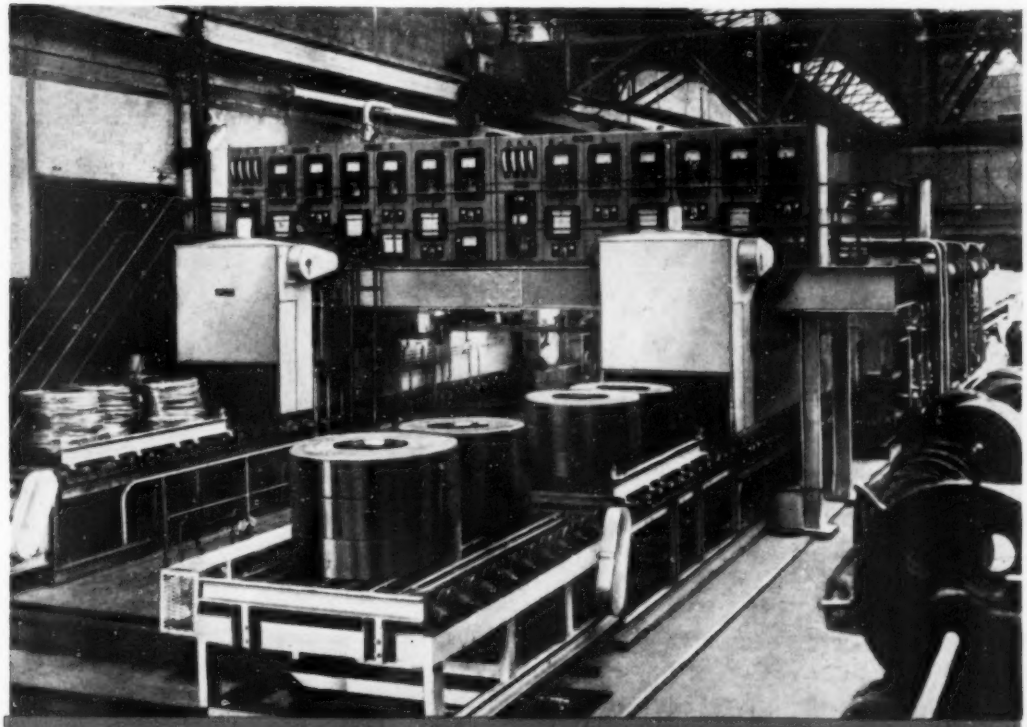

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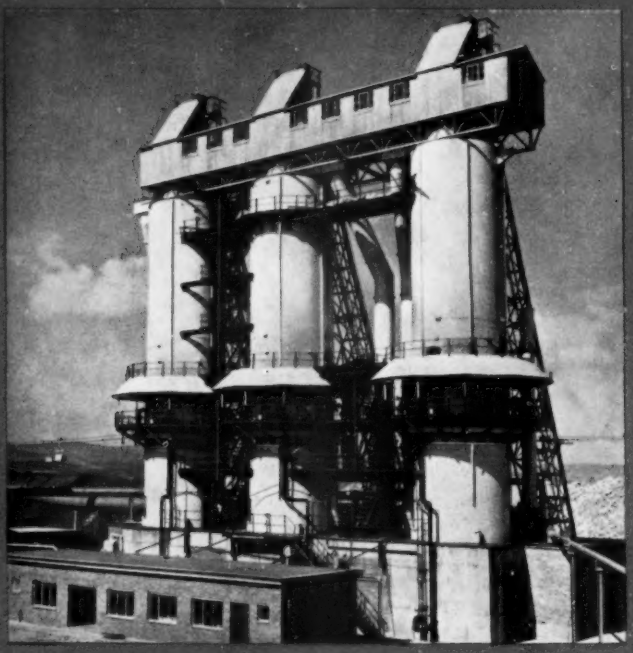

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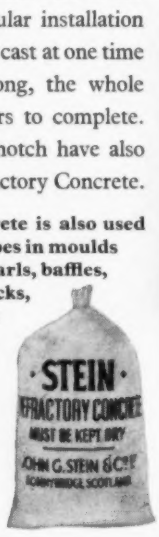

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*Slag being flushed from a Blast Furnace*

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|---|---|---|---|---|---|---|---|---|
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| ,, No. 14 | Dry | Hydraulic | 1500°C | 1200°C | 1450°C | 2⅛ | 1⅛ | 120 |
| ,, No. 16 | Dry | Hydraulic | +1750°C | 1200°C | 1600°C | 1⅝ | 1 | 160 |
| ,, No. 17 | Dry | Hydraulic | +1750°C | 1200°C | 1700°C | 1½ | 1 | 160 |
| ,, No. 18 | Dry | Hydraulic | +1750°C | 1200°C | 1800°C | 1½ | ⅛ | 160 |
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Vol. 182
No. 4835

# IRON & COAL

THE IRON AND COAL TRADES' REVIEW

MARCH 17
1961

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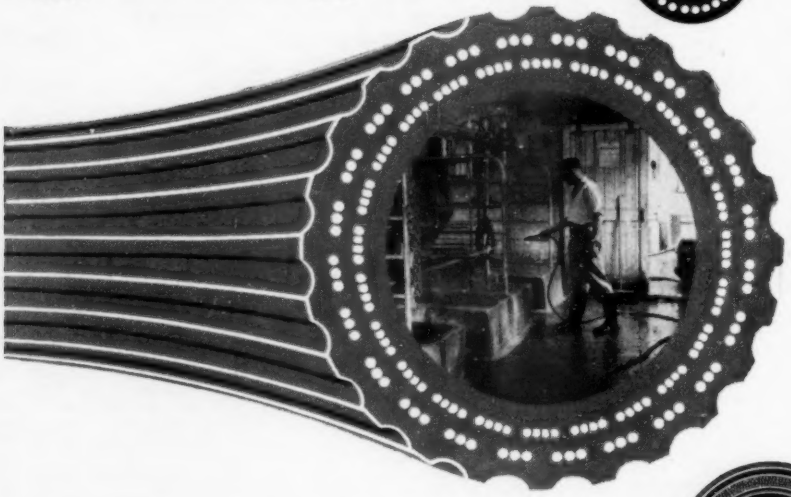

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IRON & COAL
THE IRON AND COAL TRADES REVIEW

Vol. 182 March 17, 1961 No. 4,835

# *Manpower and Efficiency*

EFFICIENCY in coal production again took another step forward in 1960. Figures recently published show an overall output per manshift of 27.8 cwt. and a face OMS of 79.8 cwt., compared with 26.6 cwt. and 74.6 cwt. respectively, for 1959. The industry is to be congratulated on this march forward. However, there are signs on the horizon that there may be a certain amount of self-deception in placing too much emphasis upon the measure of efficiency simply in terms of output per manshift. To be able to rely fully on these figures, the basic requirement is a stable labour force, and in this era of planned contraction, it is far from stable.

All associated with the administration of the industry are agreed that the National Coal Board adopted the right policy in restricting the recruitment of specific classes of labour, encouraging the retirement of elderly employees, and closing uneconomic pits, thus bringing about a reduction in manpower with a minimum of redundancy. There can be no doubt that this action averted what could have been a major crisis, but it has also started an adverse trend that might now be rather difficult to correct. The major decline in the manpower of the industry has proved to be much greater than had been foreseen and it is ironical that men are leaving coal mining in areas where they are most needed.

There are indications that this trend is affecting the economy of the industry. Mr. Robert A. Moore, in his presidential address to the Institution of Mining Engineers recently, indicated that in a number of districts high-efficiency production is being lost because of manpower shortages at the required places.

Many pits are undoubtedly struggling to attain maximum output with a minimum labour force and, although it must be agreed that, ideally, these conditions should lead to increasing efficiency, there arises the danger of operating the industry with too few men. It has often been said, and it will bear repetition, that mining is an extractive industry. The implication is that potential outputs, both large and small must continually be provided.

It would be a serious situation, verging on the catastrophic, if the mining industry was not able to supply the fuel to generate a sudden demand for power. But this is by no means beyond the realms of possibility, bearing in mind that the estimated requirement for coal for electrical generation for 1970 is between 80,000,000 and 90,000,000 tons—almost double the demand for 1960.

This demand for coal must be met largely by mechanization and with coal faces travelling at speeds which are now considered phenomenal. A similar situation occurred when rapid tunnelling was required during the extensive reconstruction programme launched during the first 10 years of nationalization. Tunnelling rates have been greatly increased, largely by improved organization demonstrated at drivages where particular attention has been paid to this aspect. Mr. E. J. Kimmins, the new production director of the North-Western Divisional Coal Board, recently suggested that the same methods of improving organization could be applied to mechanized faces. This seems an excellent suggestion and worthy of serious consideration.

During the last 10 years the basic requirements for mechanically loading coal, especially in seams of 4 ft. or more, have been developed and proved in a great variety of conditions. What is now needed is an intensive study of the organization needed to keep these expensive machines producing coal for maximum periods, so that the demand for coal can be met should the occasion arise.

One of the main aspects of such organization must be the maintenance of power loaders and associated equipment. This again raises the manpower problem, for, as the growth of power loading continues, more and more mechanics and fitters will be required, and in the interests of efficiency, these men must be used in the best possible way by a more rigid application of planned maintenance and the practice of unit replacement.

It is interesting to note that the maintenance staff at Friedrich Heinrich Colliery, a highly efficient pit in Germany, employing a total of 4,050 men, numbers 450, or a little over 10 per cent. of the labour force; the maintenance staff at British mines is between 4 and 5 per cent. Clearly more fitters are required to maintain and service the machines that will inevitably become among the principal weapons in the competition with oil and other fuels.

The engineer and the mechanic in the industry will continue to gain status and operative value as these modern methods of winning coal are brought into wider operation and if it means a fresh conception at all levels of the fundamental requirements of coal mining's labour force, the issue must not be shirked.

**Copies of the Index to Vol. 181 are obtainable (post free) on application to the Publisher.**

# *Passing Thoughts . . .*

RECENTLY the managing director of a well-known steel company suggested that a firm should be rewarded for any increase in exports it might achieve by being granted tax relief on the profits it makes from its additional exports. The effect of this would be to encourage firms to get down to the more difficult task of selling their goods abroad instead of concentrating their efforts solely on the home market. A discriminating tax relief of this kind is an incentive which is far more likely to achieve the desired results than, for example, a reduction in surtax.—Man and Metal, the journal of the Iron and Steel Trades Confederation.

*Discussions on export credit are apt to generate more heat than light. On one side of the fence the industrialists who complain most tend too easily to assume that all would be well with British exports if only the finance were available. . . . On the other hand the official attitude has undoubtedly in the past been unduly complacent.—Financial Times.*

I only hope that the Chancellor, in his deliberation for the coming Budget, will provide super-incentives, now many decades overdue, to the "Geese that lay the Golden Eggs"—the long suffering management, executive, and professional workers.—Mr. A. F. OATLEY, chairman and managing director of Cannon (Holdings), Limited.

*It cannot be over-emphasized that the time for shilly-shallying is over and that some tangible benefit for export trading which can be measured in terms of taxation relief is urgently needed in the forthcoming Budget.*—MR. JOHN COCHRANE, *deputy chairman and managing director of James A. Jobling & Company, Limited, heatproof glassmakers, of Sunderland, in a letter to The Times.*

The status of market research must be raised so that people realize that it is the scientific study of consumer needs—a method of telling industry what to produce, how much to charge, and how much would be bought.—LORD CHANDOS, chairman of Associated Electrical Industries, Limited, speaking at the annual luncheon of the Market Research Society.

*During the Biblical studies class at a Newport school, a child from Llanwern was asked: "Who were the three Wise Men?" "Richard, Thomas, and Baldwin," he replied—Westgate, in the Western Mail.*

Some tough struggles may lie ahead in persuading the men to co-operate in the use of the newest machines introduced by the Coal Board which—because they no longer break up coal and make it unfit for household use—are much more suitable for use in Yorkshire than the older models—The Economist.

*In these days [colliery] managers are highly skilled, well educated, and very well paid. What is wrong? More especially, what is wrong in Yorkshire?—Letter in the Yorkshire Post.*

Over the years these differentials [in pit pieceworkers' rates] have been allowed to expand to such a degree that a pieceworker at one pit can be receiving in wages more than his colleague at another pit and not necessarily be working as hard. How long can this situation go on?—Letter in The Guardian.

*What a sad commentary it is to think that most employees look to the pools, not only for the fortune they may bring but for the opportunity to "tell the boss where he gets off." If relationships were right you would not hear this comment so often.—Letter in the Yorkshire Post.*

It is one of the characteristics of the British nature that we do not give information freely, whether it be the names of roads, the destination of buses, the railway and bus timetables, or writings in technical books and magazines.—MR. P. J. EDMONDS, chairman of a "Books for Industry" exhibition which opened in Birmingham on Tuesday.

*The miners are suggesting a strike because of the increased health charges. What about the housewives striking over the ever-increasing charges for coal?—Letter to the Daily Express.*

---

# Protection Urged over Rating of Heavy Industry

DESCRIBING the rateable value to which his own firm had been increased as "staggering," Mr. Archibald Gilchrist, engine works director of Barclay, Curle & Company, Limited, shipbuilders and engineers, of Glasgow, said last Saturday that light industries being encouraged to enter the district should not have things made too easy for them at the expense of the traditional heavy industries.

Mr. Gilchrist, who was speaking at the annual dinner of the West of Scotland Association of Foreman Engineers, said the rateable value of the firm's yard was up from £6,679 to £51,250, and the engine works from £3,486 to £16,500. It was obvious, he said, that Glasgow must diversify its industries, "but let's not make it too easy for the light firms to come here and get factory space at uneconomically low rates and make it too difficult for heavy industries by increasing rateable values and, in addition, contemplating the removal of industrial derating."

Mr. Gilchrist appealed to Mr. John C. George, Parliamentary Secretary to the Minister of Power, who was a guest at the dinner, to use what influence he had to stress to the Government the "folly of cutting out industrial derating under present circumstances."

---

## Government Gives DSIR Bigger Grant

INCREASE of £2,500,000 in the Government's grant to the Department of Scientific and Industrial Research for the coming year is shown in the Civil Estimates published on Tuesday. The largest increases come in the grants for investigation and research in the scientific field as well as in post-graduate training awards.

Grants for scientific research both in universities and to other bodies and individuals will be increased by over £1,000,000 to £2,600,000.

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# *UK Steel Investment*

## £146,000,000 IN 1960, AND STILL RISING

REPORTING that capital expenditure in the iron and steel industry in 1960 was £146,000,000, nearly 50 per cent. greater than in 1959, the Iron and Steel Board states that this was close to the total of estimates made by individual companies at the beginning of the year, which contrasts with experience of earlier years when actual expenditure regularly fell below these estimates. A further substantial increase in expenditure is expected in 1961, resulting largely from the work on the new wide strip mill plants in Wales and Scotland.

While expenditure on all the main processes increased during 1960, the relative proportions showed certain changes. Percentages of total expenditure on the various processes in 1960, with the figures for 1959 in parentheses, were:—Coke ovens, 6 (8) per cent.; raw material treatment and blast furnaces, 20 (23) per cent.; melting shops 13 (12) per cent.; mills and finishing, 57 (52) per cent.; unclassified, 4 (5) per cent.

The estimated proportion of total expenditure on the various processes in the current year are:—Coke ovens, 5 per cent.; raw material treatment and blast furnaces, 16 per cent.; melting shops, 18 per cent.; mills and finishing, 58 per cent.; and unclassified, 3 per cent.

### Rolling Mill Modernization

The rising proportion of capital expenditure on rolling mills and finishing equipment, says the board, reflects the high initial expenditure on the rolling mill units of the wide strip mills. There is also much modernization of other rolling mills in progress, including the provision of universal stands at the heavy section mills to produce more efficient structural shapes. The growing relative expenditure on melting shops includes the installation of the new pneumatic processes at a number of existing plants as well as at the new integrated works.

The fuller results of the census of stocks taken at the end of December, 1960, indicate that stocks rose during the fourth quarter by 270,000 tons, or a little over 6 per cent.—slightly greater than the provisional figure issued by the board last month. Among the products, stocks of steel sheet at users' works showed a further rise, but the increase of 25,000 tons or 3½ per cent. was much less than the increases during the earlier quarter of the year. Stocks of tinplate remained constant during the fourth quarter of 1960, but stocks of plate and other products showed substantial increases.

The results for the fourth quarter confirm the earlier indication that the increase in stocks during 1960 took place mainly at the larger firms in private industry. Smaller private firms also increased their stocks, but to a less extent, while stocks held by the nationalized industries showed a slight downward tendency.

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LICENCE has been granted to Henry Simon, Limited, by the Midland-Ross Corporation, of Cleveland, US, to make and sell its Waldron web processing machinery. A range of machines will be marketed in western Europe and the Commonwealth under the name of Simon-Waldron.

## UK Loses £50,000,000 Steel Plant Order

IT is believed that British concerns would have accepted an offer by the East German Government to supply steel rolling mills and other steelmaking equipment worth about £50,000,000, if the Exports Credits Guarantee Department had been able to provide the necessary facilities. The East Germans wanted the deal spread over three years, but they have now accepted the French offer of credits of £7,500,000 annually spread over five years.

A spokesman for the Export Credit Guarantee Department said: "We are only prepared to cover capital goods for East Germany up to a limited extent." In this instance, he went on, the advisory council had not felt able to extend long-term credit cover on the scale required.

Speaking at the company's exhibition at the Leipzig Fair, Mr. K. R. Turner, director of Guest Keen & Nettlefolds, Limited, group export services, urged more Government help for UK steel exporters to East Germany. He said: "We do a very substantial business with East Germany, mainly in rolled steel goods. We are confident there is more business for us, particularly in steel products, and we would like to see the politicians doing all they can to help us."

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## *Welding Technology Course*

IN response to representations from the Institute of Welding and the British Welding Research Association the Ministry of Education has set up a post-graduate course in welding technology. The minimum enrolment to ensure the holding of the course has been secured as a result of promises from Associated Electrical Industries (Manchester), Limited, British Oxygen Company, Limited, and Whessoe, Limited. British Oxygen has also promised to endow two bursaries for a period of seven years for candidates to be selected by the institute.

The course will be at the College of Aeronautics, Cranfield, and will open in the autumn.

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FIRST THREE PHASES of the civil engineering work of the electric arc reorganization programme which Steel, Peech & Tozer, branch of the United Steel Companies, Limited, is carrying out at Rotherham, is to be undertaken by Tarmac Civil Engineering, Limited, a member of the Tarmac, Limited, group. The contract is worth about £600,000.

*Appointments*

## New Managerial Post at Richard Sutcliffe's

FORMER general sales manager of Sheepbridge Engineering, Limited, colliery mechanical and electrical engineers, of Chesterfield, Mr. Arthur Ditcher has been appointed manager of the surface division of Richard Sutcliffe, Limited, mining machinery manufacturers, of Wakefield (Yorks).

MR. A. DITCHER

Mr. Ditcher, who was educated at Chesterfield Grammar School, served an apprenticeship with the Sheepbridge Coal & Iron Company, Limited, before moving to Stothert & Pitt, Limited, engineers and ironfounders, etc., of Bath. He joined Sheepbridge Engineering in 1951 and served with the company as chief draughtsman and contracts manager before being appointed general sales manager two and a half years ago.

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Manager of Harraton Colliery (Co. Durham) since 1952, Mr. F. G. SWAN has been appointed manager of Eppleton Colliery (Co. Durham).

Mr. GEORGE BARRETT has been appointed works manager of Foster, Yates & Thom, Limited, heavy precision engineers, etc., of Blackburn (Lancs).

Manager of Eppleton Colliery (Co. Durham), Mr. ALAN H. BARKER, has been appointed an Inspector of Mines and Quarries by the Minister of Fuel and Power.

Mr. R. H. FRENCH, formerly assistant sales manager at the Salisbury headquarters of Leyland Albion (Central Africa), Limited, has been appointed manager of the Bulawayo depot of the company.

Labour relations officer at Blackhall Colliery (Co. Durham), Mr. T. WILLIS has been appointed wages and control officer of the No. 1 (North-East Durham) Area of the Durham Divisional Coal Board.

Personnel manager of William Doxford & Sons (Engineers), Limited, Sunderland, for the past two years, Mr. JOHN FRANCIS COLEMAN is to take up a similar post with the Projectile & Engineering Company, Limited, Battersea.

Mr. A. TURNBULL has been appointed representative in Co. Durham, Northumberland, Westmorland, Cumberland, and parts of Yorkshire and Lancashire for Stanley Works (Great Britain), Limited, joiners' tools manufacturers, of Sheffield.

Following the retirement of Mr. Clive Eborall, Mr. RONALD KINSEY has been appointed as representative of the Export Credits Guarantee Department in north America. He has been in the oversea division of ECGD for the past five years, concerned with market intelligence.

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REST AND RECREATION room for employees has been opened by Garringtons, Limited, forgings and small tool manufacturers, of Bromsgrove (Worcs).

## *Pit Productivity Hits New Record Level*

UP to last week, the average output per manshift this year in the pits has been 28.6 cwt., smashing all previous records, and only the influenza epidemic and the Yorkshire strike prevented it from being higher still, Mr. Alfred Robens, chairman of the National Coal Board, stated in Newcastle on Wednesday. "This is striking evidence both of the increasing confidence among the miners, and of the determined efforts they and management are making together to fight intensive competition," he said.

Up to the beginning of March, said Mr. Robens, the Coal Board had picked up over 5,000,000 tons of coal from stock this year, and sold it at the full price valued in its books. Added to the 6,000,000 tons lifted last year, this had brought stocks down from 36,000,000 tons at the end of 1960 to less than 24,000,000 tons. "This has gone a long way towards bringing our stock position into balance. It is not our intention to run down stocks too far; we shall keep sufficient coal in stock to give us flexibility to meet sudden fluctuations in demand in future."

Mr. Robens said that more men were now going into the pits, including many trained miners who left at a time when morale in the industry was low. There were, however, still more men needed in certain coalfields, particularly in Yorkshire and the Midlands and South Wales.

Mr. Robens was speaking at the golden jubilee dinner of the North-East branch of the Incorporated Sales Managers' Association.

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## NCB Denounces "Purely Political" Strike Threat

STATEMENT issued by the National Coal Board on the proposed one-day token strike by the South Wales miners on May Day in protest against the increased National Health Service charges, "deplores the threatened use, for purely political reasons, of strike action. It would achieve nothing and would be a severe setback for the mining industry."

"The industry has to fight for its future against the most intensive competition it has ever faced. The effect of such a strike can only be to weaken the position of coal in that struggle, and jeopardize the security of the men who get their living in the mining industry," the statement concludes.

The decision of the miners' Area delegate conference still has to be voted on at pit level.

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### Coal Shipments from Tyne Decline

ALTHOUGH coal and coke shipments from the Tyne fell by 52,000 tons last year, the amount of coal handled at the docks and staiths increased by 349,000 tons, or 14 per cent. The annual accounts of the Tyne Improvement Commission revealing this also show that export shipments over the year increased by 46,000 tons.

The financial year 1960 was the best for the commission since 1922. There was a revenue surplus of £153,328.

# *Coal Prices Protest*

## "CONSUMERS SHOULD NOT BEAR BURDEN OF INCREASES"

DECISION of the National Coal Board to raise its prices last September has been strongly criticized by the Industrial Coal Consumers' Council. A major point of its criticism, made in a report to Mr. Richard Wood, Minister of Power, is that a large part of the £60,000,000 a year which the increases were to yield was due to "social considerations" which should not have been borne by the consumer. It has also complained of inadequate notice and consultation about the price increases, which "largely frustrated the proper operation of the procedure for the protection of consumers."

The council's views on the policy of the Coal Board are not normally disclosed until the publication of its annual report to the Minister, but this year it has received the Minister's permission to release its comments in advance. Its report, based on representations made to it by the Federation of British Industries, the British Iron and Steel Federation, the Joint Iron Council, and the National Union of Manufacturers, and on the Coal Board's replies, was issued on Tuesday, together with the Minister's reply.

Besides its criticism of inadequate consultation on the price increases, the council has also complained of insufficient explanation of and justification for the board's need for an extra £60,000,000 each year; of lack of regard for the public interest, since the increases would be harmful not only to consumers but to the economy generally; and of the "unfair pattern of the price increases," involving discrimination between the steel and gas industries.

### "Time Allowed Too Short"

The council acknowledges the fact that in practice it is informed of proposed price changes only as "a last step in the procedure"—that is, after the Minister has been consulted by the board. But it says that when the last price increases were proposed the time allowed for the council to make recommendations to the Minister was so short as to make this safeguard nugatory.

Of the Coal Board's policy of stockpiling coal instead of allowing the industry to shrink, partly because of the social consequences of closing pits, the council says: "It is legitimate to point out that what employers can do in that respect is always limited by their financial position. Had the coal industry still been operating under private enterprise, it would in our view have been forced to take more drastic action, leaving the Government to deal with the 'social consequences' by such various means as attraction of new industries, transfer of labour, and unemployment relief, as were applied in former times." The council says that the cost of social considerations should not have been borne by the consumers. This should be "squarely faced," even if it involved fresh legislation.

"As to the financial cost of writing off assets when collieries have to be closed, we recall that the cotton industry received £30,000,000 from the Government, and that the Government are proposing to relieve the railways of the whole burden of their accumulated losses and the greater part of the liability relating to their capital value." Similar concessions, the council argues, could transform the financial position of the coal industry.

The British Iron and Steel Federation protested, firstly, that coking coal prices in general had increased far more than other coal prices in recent years, which had been unfair to the iron and steel industry as a major user of coking coal; and secondly that the element of discrimination had now been further increased, since the new prices were set higher for the iron and steel industry than for the gas industry in respect of similar types of coking coal, and even, it was believed, in some cases of identical coal from the same washeries.

The Coal Board's reply to this had been that it was introducing a more commercial element into its pricing system. A practical traders view had been taken of the conditions of all the different markets, present and prospective, demands for all grades of coal and costs of production. The council concluded, however, that it had insufficient evidence to judge whether the board was exercizing discrimination. "We feel we are entitled to more information than this, otherwise we cannot exercize our functions. If, on the other hand, you agree that the board should not be required to give us this information, then it seems clear that our terms of reference should be revised."

The Minister, in his reply to the council's report, admits that while there is no statutory requirement to consult the council in advance about prices, such consultation ought to take place. But he goes on to say that in the circumstances existing last September, longer notice could not have been given.

With regard to the council's point that a "not inconsiderable" part of the increased financial needs of the board must have been due to measures taken for social rather than strictly commercial reasons, Mr. Wood's reply is that a clear line between social and economic action is difficult to draw. "This problem, to which attention has already been drawn by a Select Committee of the House of Commons in connection with the railways, raises questions which the Government will certainly have to consider in the general context of the nationalized industries."

Regarding the question of the council's constitution, Mr. Wood says that providing as it does for representatives of industrial consumers to discuss coal problems with representatives of the Coal Board and the coal distributive trade, the council remained suitable for the purpose for which it was established. "The present terms of reference are comprehensive enough to allow discussion of any problem of mutual interest to the parties represented, and I feel that any amendment would lead to an undesirable limitation."

## *Personal*

Dr. R. B. NICHOLSON, of St. Catherine's College. Cambridge, university demonstrator in metallurgy, has been elected into official fellowship of Christ's College.

Mr. JOSEPH BRUNTON, cashier and a director of William Barraclough, Limited, ironfounders, of Stanningley (Yorks), has just completed 50 years' service with the firm. A presentation has been made to him by the staff.

Freedom of Cowdenbeath (Fifeshire) has been conferred on Mr. FRANCIS CANAVAN (82). He went down the mine as a pit boy at the age of 12 and became surface foreman at Kirkford Colliery before joining the executive side of the NUM.

Chief engineer of Stanley Works (Great Britain) Limited, joiners' tool manufacturers, of Sheffield, Mr. LAURENCE J. FORD is on a five-week visit to the US. During his tour Mr. Ford will visit factories and industrial centres and will study the latest American production techniques.

Managing director of Danite Hard Metals, Limited, of Doncaster (Yorks), a subsidiary of British Ropes, Limited, Mr. JACK BAKER, has been elected chairman of the Doncaster section of the Institute of Production Engineers. Before Tuesday's annual meeting, members of the Institute toured new extensions to British Ropes' Doncaster works.

A half century in the mining industry has been completed by Mr. WILFRED H. CHARLESWORTH who is retiring at the end of the month as purchasing and stores manager of No. 3 (South-East Durham) Area of the Durham Divisional Coal Board. A presentation to mark the occasion was made to him by Mr. L. C. Timms, Area general manager, last week.

After more than 50 years in the mining industry, Mr. ERRINGTON GASCOIGNE has retired as safety officer of the No. 3 (South-East Durham) Area of the Durham Divisional Coal Board. He started his career at the age of 13 and became manager of Bates Pit, Blyth. He has been a member of the National Association of Colliery Managers for many years and served with the Coal Commission in Germany after the war.

Export sales manager of Turner Bros. Asbestos Company, Limited, manufacturers of asbestos goods and beltings, of Rochdale, Mr. EDGAR STOTT, retires on March 31 after 42 years' service with the company. He has been a manager in the company's export organization since 1934. Mr. Stott will be succeeded by Mr. J. C. T. FELL, until recently export sales manager of Ferodo, Limited, another member of the Turner & Newall, Limited, group.

First award of the Sir Walter Puckey Prize was made to Mr. L. C. LAMBERT at a meeting of the Wales region of the Institution of Production Engineers, last Friday. The presentation was made by Sir WALTER PUCKEY, past president of the Institution, whose prize is an annual award open to first-year students taking Diploma in Technology courses in any branch of engineering in any college in England and Wales. It is made for an outstanding project in a production engineering subject.

Sir PETER ROBERTS, MP, chairman of Newton Chambers & Company, Limited, Thorncliffe, near Sheffield, and the Wellman Smith Owen Engineering Corporation, Limited, which is one of the consortium of 13 British companies which are building the £120,000,000 steel plant at Durgapur, has returned from a six-day visit to the plant. Sir Peter went to India for the Royal Visit in his capacity as deputy chairman of the India Steel Construction Company, Limited—ISCON—as the consortium is known.

## IBF Members See New Roll Foundry

SOME 60 members of the Newcastle branch of the Institute of British Foundrymen who visited the new roll foundry and roll machine shop of Armstrong Whitworth (Metal Industries), Limited, Close Works, Gateshead-on-Tyne, last Saturday, were told by Mr. J. L. Smith, foundry manager, that the company had spent £500,000 on enlarging roll-production facilities, and now hoped to increase output to 15,000 tons a year.

The new foundry, where rolls of up to 50 tons can be cast, was opened last month by Mr. Reginald Maudling, President of the Board of Trade. It is 220 ft. long, 55 ft. wide and carries a 75-ton overhead travelling crane at a height of more than 40 ft. Melting equipment comprises four air furnaces with capacities varying from 15-25 tons, and a 3-ton electric furnace for special alloy additions. The plant in the new machine shop is being augmented by a Herkules high precision grinding machine currently being installed in another part of the works.

## REORGANIZATION AT BROMFORD IRON & STEEL

TO meet the aditional volume of business expected when the new cold rolling mill is commissioned at the end of April, the Bromford Iron & Steel Company, Limited, West Bromwich (Staffs), is undergoing an internal reorganization. Emphasis is being laid on the sales side of the organization and Miss Dorothy Morris, who has wide experience in the iron and steel industry, has joined the company as commercial manager and Mr. Robert Robson has been appointed assistant to Mr. Harold Thomas, Midland area manager. Mr. Peter Strong has left the Midland sales force to become London area manager.

The new cold rolling mill at the works forms part of the general policy of expansion followed since Mr. Charles Cooper took over as chairman. At the time of the commissioning of the mill a new welded fabric reinforcement mesh factory will also be opened, and total steel output, including cold rolled strip, is expected to reach 4,000-5,000 tons per month.

## *Unions Discuss Shop Steward Training Scheme*

PLAN put forward by the motor manufacturers at the recent talks with unions that shop stewards should undergo a course of training in industrial relations, was considered by the Confederation of Shipbuilding and Engineering Unions at its monthly meeting last week. Mr. Frank Foulkes (ETU) who presided at the meeting, said that such a scheme was a matter for the individual unions and although some were sympathetic they had neither the facilities nor trained personnel to undertake such courses.

The proposals put forward by the shipbuilding employers on improving the shipyards' competitive position were also a matter for individual unions, Mr. Foulkes said. The executive of the confederation decided to apply to both the Engineering and Shipbuilding Employers' Federations for an increase in the guaranteed week from 34 hours to 42 hours.

# Steel Research Warning

## *URGENT NEED TO RESTORE BRITISH LEADERSHIP*

STRESSING the urgency of more original research in the British steel industry, Mr. Henry F. Spencer, managing director of Richard Thomas & Baldwins, Limited, said last weekend: "If we are to continue to sell enough steel directly and indirectly in the future, we shall need to improve on, and get ahead of, our world competitors by inventing new steels, lower priced steels and better plant to make, roll and process steels." There could be little doubt, he said, that it was from research that the industry could expect to get the right kind of help.

Mr. Spencer, who was speaking at the annual dinner of the Ebbw Vale Metallurgical Society, said that no one could feel happy to see to what extent for decades the country had been importing, copying, and using under licence, foreign processes and types of equipment. "Wherever we look, it is obvious that we have modernized our plants principally by importing or copying American and European methods—and now Russian—plant and processes.

"It would be an alarming state of affairs if, in the future, we continued to depend on copying other countries' processes and equipment. How, in that way, can we compete in a cruel and competitive world? We must find some means of developing originality and leadership. There must be means to do this, providing we have the will to do it. We owe it to the Government, to our manufacturing exporters, and not least to ourselves."

### "Cannot Live on the Past"

Mr. Spencer said that in the past the industry had had its famous pioneers in steelmaking, but it could not continue to live on the past, and now needed living geniuses, inventors, and pioneers. For many years, he went on, the industry had been protected from external competition and sheltered by internal prices, and it was a matter for thought whether voluntary research was enough in a fully sheltered industry.

"In our sector of the steel trade, the flat rolled steel products side, we need to develop steels, coated and uncoated, in competition with paper, cardboard, plastics, aluminium and wood; steels which are lighter, thinner, more corrosive resistant, stronger and with other technical, economic, or other useful attributes.

Mr. Spencer went on: "If one takes a look at a new so-called modern, integrated steel plant, one is appalled at the enormous amount of capital which it is necessary to sink in coke ovens, equipment for the preparation and sintering of ore, blast furnaces and steel plant. Work is, of course, going on to try to eliminate some of these extravagantly costed, separately functioning units. Undoubtedly we shall, at some time in the future, get steel direct from a mixture of ore, carbon, fluxes, etc., at a competitive economic cost. I hope that it will be the turn of our technicians and scientists to lead in this field, but there is room for doubt about that, unless we jump to it."

Referring again to RTB's sector of the steel industry, Mr. Spencer said that the cost was incredibly high for modern continuous mills, continuous annealing, tinning, pickling, galvanizing, etc. He could not believe that something much simpler and more modestly priced could not be produced in lieu of the present, fabulously costed equipment. Indeed, cheaper and simpler plant was essential if steel was to survive against future competition. Regarding the company's own development schemes at Ebbw Vale, Panteg, Redbourn, and Llanwern, he said that good as progress was, "it is not nearly fast enough for an impatient man like me."

Within the next year he expected the new electrolytic tinning line at Ebbw Vale, and all the new stainless steel rolling equipment, including the new Sendzimir mill at Panteg, to be in full operation. He was also hoping that the sinter and Rotor steelmaking plants and the continuous billet mill at Redbourn would be at work, and the iron and steelmaking and rolling mill would have begun at Llanwern.

# Full Production Delayed at India's Steel Plants

OFFICIAL sources in New Delhi report that there is some delay in getting into full production India's steel plants which are being set up at Rourkela by West German interests and at Bhilai by the Russians. Because certain vital items were left out of their original plans, the Russian plant will cost £3,500,000 more than was originally estimated.

According to the Public Accounts Committee's report presented in the Indian Parliament, the third blast furnace in each of the two plants, although completed, have not yet been commissioned owing to supply bottlenecks. Mills are working at half their target capacity.

Frequent technical breakdowns in the dolomite calcining plant is said to have been the main cause of the failure, at Rourkela, for the pig-iron output between April and August last year, to reach the expected 60,000 tons. Less than 30,000 tons were produced. Extensive repairs and realignments will have to be made.

The failure of Indian railways to deliver adequate coking coal to both plants is given as contributory factor to the disappointing results. At the Russian plant at Bhilai there have also been shortfalls in delivery of iron ore.

CONTRACT WORTH about $1,250,000 for a new flour mill in the Philippines has been placed with Thomas Robinson & Son, Limited, Rochdale. The mill is for the Central Philippine Milling Corporation and will be sited at Iligan near to Cebu City. It will have a capacity of 240 tons per 24 hours and pneumatic conveying will be used throughout.

*Orders Placed*

# CEGB Orders are Worth £33,000,000

CONTRACTS for £33,000,000 announced on Monday by the Central Electricity Generating Board, are part of its plans for building larger and more powerful coal-fired power stations to be commissioned in 1965 and later.

Four major boiler units, valued at nearly £20,000,000, have been ordered from Babcock & Wilcox, Limited, of London, N.W.1. They are for a power station with a total output of 2,000,000 kW, which, it is said, will be the most powerful in Europe.

A £13,000,000 contract has gone to C. A. Parsons & Company, Limited, of Newcastle-upon-Tyne, who are to supply four 500,000 kW single-line turbo-generators. These four machines, with the associated feed-heating plant and turbo-driven boiler feed pumps, are equivalent to an increase of more than 6 per cent. in the total capacity of generating plant installed in the UK.

The new order will be the sixth for machines of similar capacity and over to be constructed by Parsons for service in this country and oversea. One, for the US, will be the largest ever exported from any country.

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CONTRACT TO supply a 53-bell carillon for the National Episcopal Cathedral at Washington, US, has been awarded to John Taylor & Company, bellfounders, of Loughborough (Leics).

SOME 160 TONS of structural steelwork was recently shipped by Sanders & Forster, Limited, a member of the Chamberlain Industries, Limited, group, to Trinidad for use in the reconstruction of the general hospital in Port-of-Spain.

OVER £900,000 worth of hosiery knitting machinery has been ordered from the Bentley Engineering, Limited, group by the Russian trading organization, Technopromimport. The contract was concluded at the Leipzig Fair.

AN ORDER FOR six 6-ton mobile cranes has been received by Thomas Smith & Sons (Rodley), Limited, Leeds, from the Porth Authority of Bahrain. This company is also to supply six Smith "21" universal excavators and a Smith M.E.1 22½-ton truck-mounted crane to Sweden.

FOR USE AT installations at Bulimba, Queensland, Australia, and on Vancouver Island, BC, British Insulated Callender's Cables, Limited, has received two contracts for the supply of oil-filled cable with corrugated seamless aluminium sheath protected overall with an extruded PVC jacket.

FENCING CONTRACT worth over £25,000 for Kuwait International Airport was carried out by William Bain & Company, Limited, Coatbridge (Lanark). The company supplied over 33,500 m. of 10-ft. high galvanized chain link fencing and gates, and 105,000 m. of galvanized mild steel barbed wire.

LARGE CONTRACT to install lifts in the new Independence Building in Lagos, Nigeria, has been secured by the Otis Elevator Company, Limited, of London, S.E.1. The lift cars are to be made from Stelvetite, the plastic-coated steel sheet made by John Summers & Sons Limited, of Shotton (Ches).

DESIGN, SUPPLY, and commissioning of two chemical plants in the USSR is to be undertaken by Wycon Services, Limited, a company formed jointly by Constructors-John Brown, Limited, and Fisons, Limited. The contracts were placed by Techmashimport and are worth a total of over £2,000,000.

CONTRACT WORTH £13,000 has been awarded by Imperial Chemical Industries, Limited, to Wm. Boby & Company, Limited, water purification engineers, of Rickmansworth (Herts), for the supply of a dealkalization-base exchange plant at a new heavy organic chemicals factory at Severnside.

DAVIS-STANDARD 6-in. thermatic extruder for covering cables at the works of the Spanish associate of Pirelli-General Cable Works, Limited, is to be supplied by Fawcett Preston, Limited, a member of the Metal Industries, Limited, group. The machine will be powered by a 200-h.p. drive and will be able to cover cable up to 5½ in. in diameter with a plastic sheathing.

ORDERS worth over £800,000 have recently been secured by Butters Bros. & Company, Limited, Glasgow, for their latest design of shipyard level luffing tower crane. They include a £200,000 Canadian contract for a 75-ton shipyard crane and a 75-ton electric overhead travelling crane, and another £7,000 Canadian order for a different type of crane. Poland has ordered a crane worth £100,000 and there are contracts totalling about £500,000 from British shipyards.

ORDERS FROM India valued at £600,000, which Craven Bros. (Manchester), Limited, machine-tool makers, etc., have just received, brings the intake of new work since the beginning of the year to well over £1,000,000, and further substantial orders are being negotiated. The greater part of the new orders are for export and include contracts for India, Australia, South Africa, Brazil, France, Spain and Greece and have been won in the face of severe competition from continental machine-tool manufacturers.

ORDERS FROM the Harland Engineering Company, Limited, of Alloa (Scotland), for six Allen-Stoeckicht epicyclic gear units for motor-driven boiler-feed pumps to be installed in the Drakelow "C" and Bankside "B" power stations of the Central Electricity Board, have been received by W. H. Allen, Sons & Company, Limited, mechanical, hydraulic and electrical engineers, of Bedford. The gears will be built at the company's Atlas Works, Pershore (Worcs). An Allen subsidiary, Gwynnes Pumps, Limited, is to supply pumps for the floating dock which the Polish Government recently ordered from the Furness Shipbuilding Company, Limited. The parent company will supply the electric motors and control gear.

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## "END USE OF PENNIES"

SUGGESTION that all pence should be eliminated from inter-firm transactions was made by Mr. D. F. C. Mann, a member of the office administration department of Imperial Chemical Industries, Limited, to the Junior Chamber of Commerce, in London last week. The shilling should be recognized as the basic unit, he said.

A national effort was required on research into methods of improving administration, Mr. Mann, chairman of the O. & M. division of the Institute of Office Management, maintained. Paperwork rose faster than production and over 3,000,000 people were employed in offices.

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A 15-MINUTE documentary film featuring Tecalemit, Limited, lubrication engineers, of Plymouth (Devon), will be shown on March 21, in the programme "What's in a Name," on West Wales ITV.

# COAL FOR POWER PLANTS

## Supplies will be Doubled in Next Few Years

QUARTER of the coal now produced in Britain is used in electricity power stations, and within a few years this will be increased to 50 per cent., Mr. Alfred Robens, chairman of the National Coal Board, said at the annual dinner of the North-Eastern Centre of the Institution of Electrical Engineers at Newcastle-upon-Tyne last Friday. Without electricity, he told members, it would be impossible to modernize the mining industry and so enable it to hold its own in competition with fuel oil.

Mr. Robens said the electricity generating industry was a good customer of coal, and coal was a good customer of electricity. The two industries were interdependent, and to some extent "took in each other's washing."

"Coal by wire" was sound commonsense. One of the advantages of having a customer the size of the electricity industry was that the large power stations now being built brought about a reduction in distribution costs. The new power station at Blyth (Northumberland), when completed, would, for instance, use 5,000,000 tons of coal a year—an enormous order for a single customer.

### Power-loading Drive

The chairman went on to say that in the past 10 years, the amount of electricity used in coalmining had risen by 40 per cent., and at the moment the total use of electricity by the NCB was equal to the whole of electricity production in the North-East.

The coal industry was going to use a lot more electricity. Power-loading in the mines now accounted for 40 per cent. of output and the board was going to launch a mechanization drive to bring it up to 50 per cent., and later to 75 or even 80 per cent. This would mean an immense call on the electricity industry, and those concerns which produced machines, switchgear, and other equipment.

Mr. Robens also referred to the part played by electricity, in the way of telephones and radio communications, in improving safety in mines, and said he never allowed himself to forget that about 300 miners were killed each year. Radio communication underground was difficult, but the idea was being tried at two pits, including Harraton Colliery, in Durham.

Mr. Roben's toast to the Institute was replied to by Sir Hamish D. Maclaren, this year's president of the institution.

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MATHER & PLATT, LIMITED, general engineers, of Manchester—Educational and research activities are being increased and oversea markets are being studied, states Mr. W. L. Mather, chairman. Although 1960 turnover established a new record, the consolidated trading profit dropped from £1,522,972 to £1,316,774, largely due to lower profit margins. In spite of increased competition at home and abroad, the number of orders received during the year was a record. Exports accounted for 40 per cent. of the parent's turnover, compared with 33 per cent. in the previous year.

## *Return to Work at all Yorkshire Pits*

COMPLETE resumption of work at all the 14 Yorkshire pits involved in the pay strike began on the night shift last Sunday. This followed talks the previous Saturday between Doncaster miners' panel, representing 27,000 men at 11 collieries, and officials of the Yorkshire Area of the National Union of Mineworkers. The panel recommended an immediate return to work, and the resolution was approved by branch meetings at the various collieries.

The strike began three weeks ago with a claim for a 10 per cent. increase in face workers' contract rates and a guaranteed 65s. a day minimum wage, and at its height involved a total of 77 pits. Output of more than 800,000 tons of coal, worth £3,000,000, was lost by the dispute, and the miners also lost an estimated £2,000,000 in wages. The strike has also considerably reduced the amount of industrial-type coal stocked in Yorkshire. There are now 3,000,000 tons in stock, compared with nearly 6,000,000 tons in January, 1960.

## UNOFFICIAL STRIKES "SABOTAGE"

"FOR members of a union to ignore the sensible advice of union leaders is nothing short of sabotage, with all its implications," Mr. Edric W. Lane, general manager of the Worksop Area of the North-Eastern Divisional Coal Board, told Area officials and staff on Saturday. Speaking at the Area annual dinner he said that all realized that a union leader's task was not easy, and there had been an example of the worry and responsibility which could descend on leaders' shoulders during the recent strike.

"A great many people have yet to learn that we live in a highly competitive world and if we, as employees of the National Coal Board, do not enter fully into this competition by making ourselves efficient on every front, we deserve all we shall certainly get from our competitors," he declared.

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BUILDING OPERATIONS are expected to start soon on the new piston component factory at Sunderland for Hepworth & Grandage, Limited, Bradford. First phase of the plant, a machine shop for piston ring manufacture, is expected to begin production early in 1962, and a two-storey foundry building will come into use by about June the same year.

# *Coloured Coal Scheme for Fuel Grading*

SUGGESTION that coal might be coloured according to grade, in order to overcome some of the criticisms which have been levelled against a minority of coal merchants, has been put to the Minister of Power, Mr. Richard Wood, by the Coal Merchants' Federation of Great Britain. The move follows complaints that a few dealers have sold low-grade coal to the public at high-grade prices. This was made known by Mr. Peter Hawksfield, president of the federation, last week, who said that a "mutually agreeable" plan for the distributive coal trade was hoped to be put to the National Coal Board by May.

Mr. Hawksfield said that, but for the relatively mild weather experienced this winter, there might well have been a serious shortage of house coal in many areas. During the coming months, the merchants intended to intensify their annual campaign to persuade the public to stock up in the summer, but the real solution to the problem rested with the board, as the producer of domestic fuel. Because of this, it was urging the board to increase the proportion of house coal mined, even if it meant reintroduction of Saturday working at selected pits, and the reopening of certain open-cast sites.

In this direction, the board has recently increased production of the larger coal suitable for household grates from 22 per cent. to 24 per cent. of total output. This has been achieved by drawing the attention of the miners to the need for coal-getting without unnecessary breakage and by manipulating mining machinery to avoid crushing coal, and in some cases by withdrawing machines from service.

It is felt by both sides, however, that the problem is not of an intrinsic shortage of coal but of the variability of demand. About 90 per cent. of coal for domestic use is purchased in the winter months, and both sides are to make attempts this summer to change this habit by heavier advertising campaigns than ever before. At the same time, the Coal Utilization Council is making attempts to persuade builders and architects to provide more coal storage space in their designs for new houses.

Mr. W. T. Mainwaring-Hughes, the federation's senior vice-president, suggested that the introduction of a large-scale credit system for coal sales might be impracticable without financial assistance from the NCB. The board had been asked for such help, he added, but it had pointed out that if credit were extended to householders, industrial users might also ask for similar facilities.

## Australia Lifts Iron-ore Embargo

EMBARGO which Australia had placed on the export of all but high-grade iron ore for the past 22 years has been lifted. Introduced in 1938, the embargo was to ensure that the country's then known iron reserves were not depleted too quickly. A survey of the iron-ore deposits last year revealed an increase in the known reserves of over 100,000,000 tons.

Senator William Spooner, Minister for National Development, said that the Federal Government hoped that iron-ore exports would now aid Australia's foreign exchange position.

LONDON OFFICE of Guest Keen Iron & Steel Works, under the management of Mr. Victor Harvey, has moved to GKN House, 22, Kingsway, London, W.C.2.

# Productivity Increases in West Midlands NCB

RECORD level of productivity and a decline in the rate at which men are leaving the pits is reported for February by the West Midlands Divisional Coal Board. In the first eight weeks of the year, 121 men have been lost in the division compared with 800 in the corresponding 1960 period. Output per manshift, overall, topped 30 cwt. for the first time, and at the face, output was 1.25 cwt. over the previous best figure at nearly 95 cwt.

Three Areas of the division set new records. North Staffordshire broke the record for OMS at the face, established in December, with a figure of 101.9 cwt., while the overall output figure of 29.8 cwt. was nearly 0.25 cwt. better than the previous record. At 94.8 cwt. per manshift, face productivity in Cannock Chase Area was over 1.25 cwt. above the previous best and overall productivity was over 0.5 cwt. better at 30.2 cwt. In South Staffordshire and Shropshire there was a 0.75 cwt. improvement on the previous best overall figure of 27.8 cwt.

## *1,000,000 Absentees a Day*

MORE than 1,000,000 people are absent from work in the UK every day. Revealing this, the latest publication of the British Institute of Management, "Absence from Work — Incidence and Control," estimates that the cost of absenteeism per manual worker in 11 sample companies was up to £2 4s. 5d. a week. Out of the sample firms, eight worked overtime to make up the losses, three had costs arising from redeployment, and only one took on extra staff.

The causes of absenteeism are many and varied. A longer working week is a contributory factor—in the case of women the overall absence rate is 20 per cent. higher for those working a five and a half day week. The publication finds a relationship between the size of the company and the absence rate—it is much lower for small concerns. Locality, too, is important, as persons feeling slightly unwell may attend work if they only face a 20-min. journey, but not if it takes an hour.

## Assessment of Derbyshire Carbonization Plants

RATING assessment of three of the coal carbonization plants in Derbyshire has been agreed between the valuation officer and the National Coal Board. The net annual value of the Avenue carbonization plant at Wingerworth is to be increased from £120,000 to £127,000, with a consequent increase of £3,500 in the rateable value to £63,500. A new net annual value of £13,900 has been agreed for the Hardwick plant, bringing its rateable value to £6,950.

The Grassmoor plant now has a rateable value of £7,125 a year on a net annual value of £14,250. The rateable value of this plant is to be reduced to £730 retrospectively to July 1, 1960, because production has ceased there.

MICHAEL COLLIERY won the annual competition at Cowdenbeath Central Rescue Station on Saturday. There were 12 teams competing and the runner-up was the Bowhill Group of collieries.

# TRENDS IN THE DEVELOPMENT

# *of Rolling Mill Guides*

*This article on rolling mill guides is translated from Metallurg, 1960, V, No. 3, pp. 17-23.*
*The authors, V. P. Fedin, I. F. Prikhod'ko, and N. F. Gritsuk, are at Vniimetmash and the Magnitogorsk Iron and Steel Works.*

UP to 1950, rolling mills in Russia were equipped exclusively with friction-type mill guides. At the present time, as well as friction-type guide equipment, increasing use is being made of guides based on the principle that the stock rolls over rollers built into the guide.

Existing types of guide equipment may be classified by the following characteristics:—(*a*) Their location on the mill stand; (*b*) the structural design of the guide component, and (*c*) the nature of the friction between the stock and the working elements of the guide.

According to their location on the stand, guides are divided into entry and exit guides. When designing a guide component, account is taken of the required position of the section in front of the entry into the pass in the work rolls, and the need to hold the stock to prevent it turning in the pass, and to prevent movement of the stock to one side.

The design of an entry guide component is substantially influenced by the roll pass design for a given section. Where there is automatic centering of the stock by the surfaces of the roll passes, there is no need for accurate introduction of the stock into the pass, or for holding it to prevent it turning during rolling. At the same time unstable rolled sections should, during the rolling process, be reliably supported by the guide mechanism from turning and from lateral movement. Thus the structural design of the guide mechanism is varied in relation to the actual working conditions.

An exit guide imparts the correct direction of movement to the stock on its exit from the work rolls, protects the ends of the stock from flexure arising as a result of pressure from above or below, uneven heating and inhomogeneous deformation. An exit guide which operates reliably ensures the correct entry of the stock into repeaters or into the entry guide of the following stand.

Striper guides and stock twisters play a special part in continuous mills and mills with open passes which have repeaters. If a twist guide becomes worn, then there is a reduction in the required angle of twist of the stock, and the guide incorrectly introduces the stock into the work rolls of the following stand. This leads to distortion of the section and a reduction in the yield of sound product. Adhesion of particles of metal to the working surfaces of an exit guide not infrequently leads to jamming of the front ends of the stock and breakdowns in the mill.

Replacement of sliding of the stock being rolled over, the working surfaces of the guides by passage of the stock between rollers was carried out first of all in continuous billet mills rolling intermediate sections, and in the entry guides of section mills rolling alloy steels.

The great advantages of roller-type guides by comparison with friction-type guides have led to the subsequent wide application of the former. During the rolling of grooved sections (beams, channels, rails, etc.), as a rule, friction-type guides are used because they are simpler in design than a roller-type guide. Designs already exist, however, for roller-type guides, employed for rolling angles and other grooved sections. During the rolling of simple sections (rounds, squares, strip, etc.) the roller-type guide is acquiring ever wider application, especially in medium section, small section, and wire rod mills.

By way of typical designs for roller-type guides, experience in operation in the USSR and abroad has given prominence to the guide with a single pair of rollers, for instance, entry guide boxes with rollers seated on flat springs. [The reference here is to Mörgardshammer guides.—*Translator.*]

Similar designs are used in the finishing stands of the section mills at the Magnitogorsk, Chelyabinsk, Makeev, Stalinsk, and Krivoi Rog iron and steel works, and the "Hammer and Sickle" Works.

An entry guide of this design has the following advantages:—Ease of setting; reliability in holding the stock from sagging and lateral movements, and the considerably smaller amount of force required to push the stock through the rollers than in multiple roller designs. The relatively greater length of the troughs normally placed in front of the rollers ensures good operation of a guide with a single pair of rollers even in looping mills.

The roller entry guide which most completely satisfies normal requirements under production conditions is the design of the guide for the finishing stand of the 300-mm. medium section mill

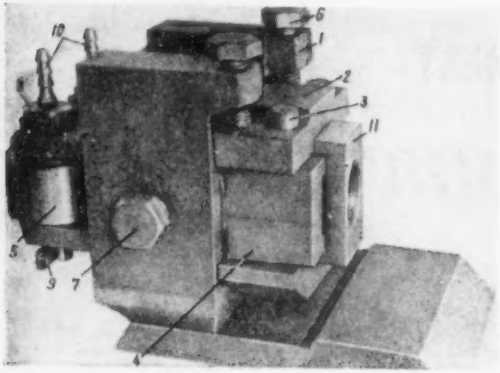


FIG. 1.—ENTRY GUIDE FOR THE FINISHING STAND OF THE 300-MM. MILL AT THE MAGNITOGORSK WORKS.

1.—Box. 2.—Rotating yoke. 3.—Pin. 4.—Side plate. 5.—Roller. 6.—Clamping bolt. 7.—Setting bolt. 8.—Shaft. 9.—Cotter pin. 10.—Nipple. 11.—Funnel.

at the Magnitogorsk Works (Fig. 1). In addition to the advantages indicated above, this has yet another—the ability to rotate the rollers about the rolling axis, which is essential for the production of a true section. Rotation is effected by means of a yoke, secured with flat springs, on the ends of which are located the rollers.

The use of rollers is not restricted merely to entry guides. In recent years a series of successful designs has been developed for roller exit guides. Fitting of rollers in the lateral guides reduces the number of defects, the majority of which in practice arise, in fact, through friction of the stock against the side plates and not against the actual guides themselves.

In the majority of designs for roller-type exit guides which direct or turn the stock on edge, friction-type stripping guides are placed between the work rolls and the guide rollers. The stripper guides fulfil the same functions as in friction-type guides; they take the stock from the work rolls and prevent flexure of the front end of the stock and sticking to the work rolls.

Experience in the operation of continuous section and billet mills shows that, during the rolling of simple sections (rounds, squares), the stock does not jam in the passes of the finishing stand. In this connection the exit stripper guides can be replaced by funnels (Fig. 2). This use of funnels in combination with rollers considerably simplifies the design of exit guides, and facilitates their setting, and speeds up roll changing and changes of the rolling line from pass to pass, while it also eliminates stoppage of the mill to hammer open worn friction guides and concomitant breakdowns. Similar designs in the form of tubular guides are fairly widely employed in wire rod and small section mills.

Experience in the operational use of twist roll stands, to the design put forward by S. V. Merekin, in continuous billet and section mills in Russia has confirmed the expediency of their installation. The low rigidity and inadequate reliability of setting resulting from the short working life of the bonded resin bearings of the original design have been eliminated during its modernization, which has been carried out at the Makeev works. The design was put forward by V. F. Langanskii and K. V. Kuchevskii.

The twist rolls are mounted in a special stand, located in the immediate vicinity of the work roll stand. The bearing components of the rollers are carried in anti-friction bearings, which considerably increases their working life. Twist roll stands can at the present time be considered the most successful design of twist guide for continuous billet mills and the roughing stands of section mills.

In Fig. 3 is presented the roller guide of the 730-500-mm. sheet-bar and billet mill to the design of the Southern Urals Machinery Works. It should be observed that the original installation of entry rollers in this mill, together with exit guides for turning the stock, did not give satisfactory results. Rollers with intermediate funnels instead of open troughs for carrying the stock complicated the setting of the gap between the work rolls.

Experience in operation shows that in continuous billet mills and in the roughing groups of continuous section mills, rolling heavy, simple sections which are twisted between stands, ordinary open-entry troughs can successfully be used on the entry side of the stands. For purposes of simplicity, it is advantageous to make them of welded construction. Cooling with water prevents buckling of the troughs under the action of the high temperatures.

A special place in the equipment of continuous rolling mills is occupied by roller straighteners. They are not connected with the exit guides, and

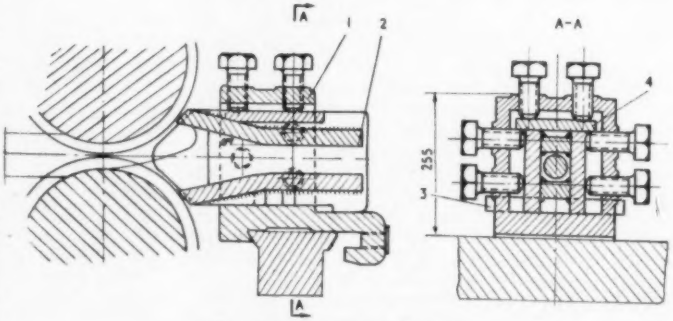


FIG. 2.—RECEIVING FUNNEL.

1.—Box. 2.—Funnel. 3.—Setting arm. 4.—Plate.

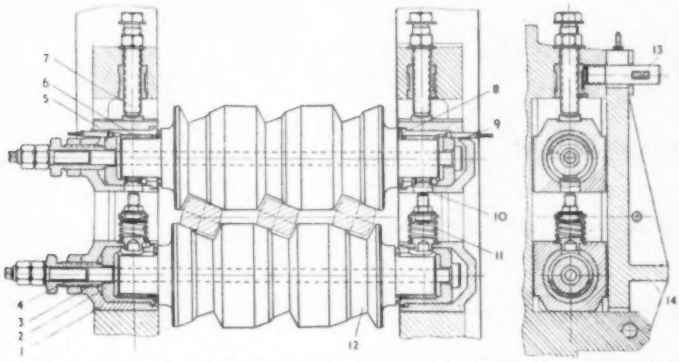

FIG. 3.—EXIT ROLLER TWIST GUIDE OF THE 730/500-MM. SHEET-BAR AND BILLET MILL.

1.—Lower chock. 2.—Lower bearing box. 3.—Regulating bolt. 4.—Shaft. 5.—Upper chock. 6.—Bush. 7.—Screwdown. 8.—Thrust bearing. 9.—Upper bearing box. 10.—Levelling screw. 11.—Spring. 12.—Roller. 13.—Cotter. 14.—Deflector plate.

they are installed behind the finishing stands of continuous billet and section mills. The straighteners protect the lengths of stock emerging from the finishing stands from twisting and buckling before they reach the cooling beds. An increase in the wear resistance of roller guides may be attained by increasing the working life of the basic components, *i.e.*, the rollers. At the present time work is being carried out in this direction at many works.

The highest working life is possessed by rollers of grey or alloy cast iron with a chill-hardened surface, and also rollers of low- or medium-alloy steel with a surface deposited with TsI-1M, TsS-1, and TsS-2 (Sormite) electrodes. Such rollers can be reconditioned by surfacing directly in the mill. Their reconditioning by surfacing with hard alloys is cheaper than the manufacture of new rollers.

In the interests of further improvement in the surface quality of the rolled stock and an increase in rolling accuracy, at the present time roller guides are being installed not only in the finishing and leader but also in the intermediate and roughing stands of rolling mills. In this connection a pointer is given by operational experience in the 300-mm., medium section mill at the Magnitogorsk Works and the continuous section mills at the Chelyabinsk (300-mm.) and Makeev (350-mm.) works. Especially great importance attaches to roller guides in intermediate and finishing stands of mills which are rolling light metals and alloys, since they are very susceptible to scratches on the surface of the rolled stock.

The manufacture and installation of new rolling mills demand the development of designs of roller-type guides to operate at rolling speeds up to 20 m./sec. and over. Under such conditions special attention should be devoted to the bearings of the rollers, which at the present time operate at the limiting permissible speeds. It is necessary to use bearings with reliable protection against the infiltration of water and scale.

The endeavour to reduce to the minimum the time expended in setting the mill equipment after roll changing or a change in the pass in use, has brought with it the emergence of new methods of fastening the guide equipment to the roll stands.

In Fig. 4 is shown the fitting of a guide on an arm, which can be swung to one side. In the working position the arm is secured by a stop, dowel, and cotter pin. During roll changing the guide does not have to be removed from the arm, which considerably shortens the time of setting the stands. Such a design is employed in a section mill designed in Czechoslovakia.

Another design of arm permits movement of the guide when rolling is changed into another roll pass, without disturbing its fastening and setting. This restricts the time expended in the setting of the stands of multi-stand continuous, section, and wire-rod mills with open stands.

The majority of continuous billet and section mills recently designed and manufactured are equipped with vertical roll stands. The absence of turning of lengths of stock of heavy cross-sections in these mills, as shown by experience in operating the 850/700/500-mm. mill at the An'shan'sk iron and steel works in the KNR, makes it possible to use friction-type guides in all the stands of the mill without lowering the surface quality of the billets.

In Fig. 5 is shown the fastening of the guides in the stands of the 700/500-mm. continuous billet mill at the iron and steel works in Bhilai, India. The equipment on the exit side of the horizontal and vertical stands of this mill does not include guides, which are replaced by funnels

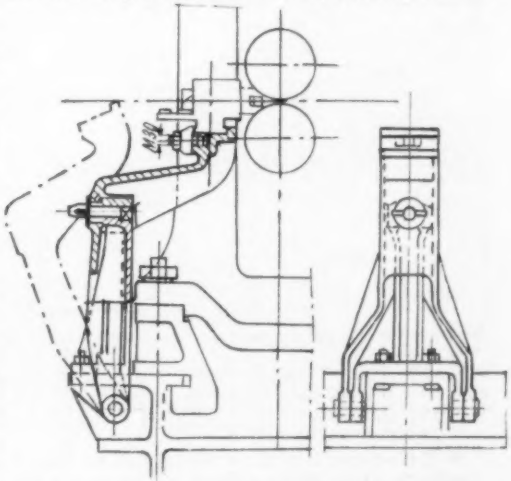

FIG. 4.—FIXING OF THE ENTRY GUIDE ON AN ARM.

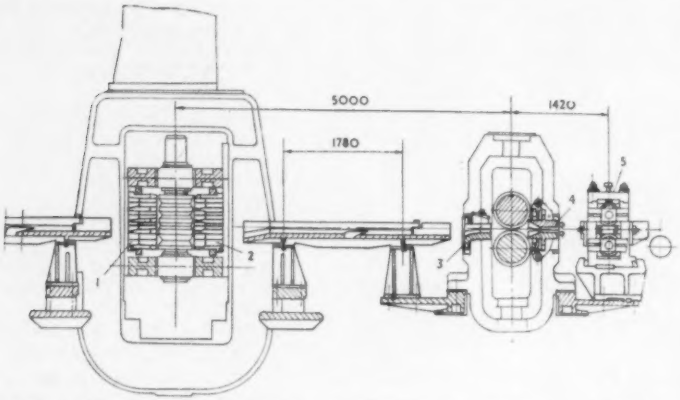


FIG. 5.—GUIDE EQUIPMENT OF THE 700/500-MM. CONTINUOUS SECTION BILLET MILL.

1-4.—Entry and exit guides, respectively, of the vertical and horizontal stands. 5.—Straightener.

of special design; these are easily opened, if the stock jams. The vertical stands of new section mills are equipped with roller-type guides (Fig. 6).

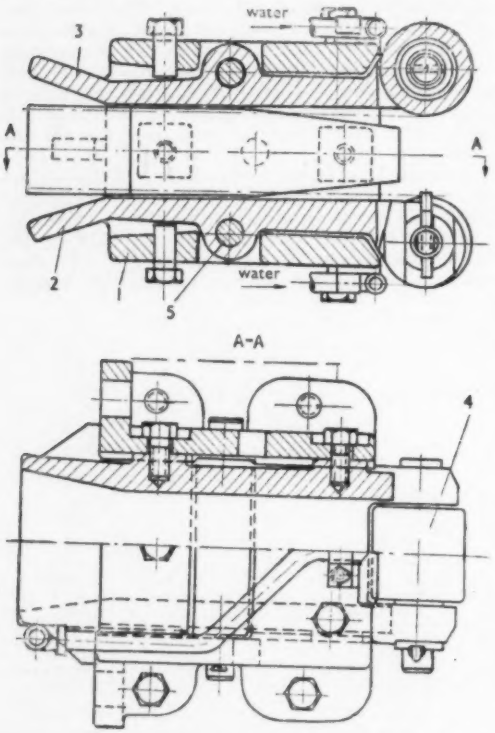


FIG. 6.—ENTRY GUIDE OF A VERTICAL STAND.

1.—Box. 2 and 3.—Side plates (right and left). 4.—Roller. 5.—Pin.

In design these guides are similar to those for horizontal stands.

In small-section and wire-rod mills the existing entry roller guides of the stands of the finishing groups and trains have somewhat larger dimensions than the friction-type guides; this is governed by the design of the roller guides and the dimensions of the rollers. Therefore, in multi-stand, small-section and wire-rod mills, for the purposes of greater utilization of the length of the work roll barrels use is made of friction-type guides. Under such conditions the wear resistance of the entry channels can be increased from 7.5 to 13.5 times by plating their working surfaces with chromium or boron.

During multi-stand rolling in the 250-mm. wire mill at the Beloretsk Works, use is made of channels with inserts of the hard alloys VK-6 and VK-8.

In large iron and steel works, having in their make-up a large number of rolling mills, as experience shows, it is expedient to have a small shop for the manufacture and repair of guide equipment. In the composition of this shop there should be forging, iron casting, and surfacing sections, and also a lathe shop capable of carrying out the necessary machining of the guide components.

For equipping new rolling mills with modern guide equipment and for the complete replacement of obsolescent equipment a specialized factory should be included for the production of such equipment, similar to a works for the production of work rolls. Dissemination of up-to-date information on rolling practice and a close link between the workers of such a factory and production engineers will permit a constant improvement in the designs of guide equipment.

In considering the organization of a centralized supply of guide equipment, designed on the basis of up-to-date experience and manufactured under conditions of a modern machinery construction works, account should be taken of the experience of progressive countries, especially the USA and Sweden.

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**Engineer Buyers Guide**

The principal features of the 1961 edition of "The Engineer Buyers Guide" includes the following:—Forthcoming engineering and industrial exhibitions; technical associations, institutions, and societies connected with the engineering industry; national undertakings; UK agents for foreign firms; trade names, and a buyers' guide. Copies may be obtained from The Engineer, 28, Essex Street, Strand, London, W.C.2 (price 10s., postage 2s. extra).

# MECHANIZATION IN SOUTH WALES

## *Problems Associated With Power Loading*

by G. V. STANDERLINE, M.I.M.M., A.M.I.Min.E.*

*In this paper, presented to the South Wales Branch of the National Association of Colliery Managers on January 10, 1961, the author describes some of the problems associated with mechanization in the South-Western Division of the National Coal Board. Special mention is made of the application of coal ploughs and their ability to negotiate geological disturbances. The mechanization of operations ancillary to coal-face operations, namely, the drivage of roadways and the preparation of stable holes, is also discussed.*

BEFORE examining the numerous problems associated with mechanization in the South-Western Division of the National Coal Board, it will pay to look at the position over the last few years. The number of ploughs increased steadily at first, more rapidly later; the number of shearers rose to a maximum within three years and then fell quite rapidly. There has been a steady increase in the mechanization of room-and-pillar working, though the total amount of coal obtained by this method is still small.

Table 1 shows the equipment used and the overall results obtained from 1953 to September, 1960. The important point concerning face mechanization is that some form of shearer or the rapid plough is able to operate in most conditions and it is worthwhile, therefore, to compare the performance of each of these machines.

Table 2 gives a series of comparisons which show that, over a long period, there is little difference in o.m.s. or bulk tonnage, the advance per shift is considerably greater with the plough, and there is little difference in face length. The area extracted per machine shift with the plough is considerably greater, the average seam section worked has remained fairly constant, but has steadily increased with the shearer, and the plough generally works in seams considerably thinner than the shearer.

From a distribution point of view the position is that ploughs are working throughout the whole of the South Wales coalfield in all Areas, in all types of coal, and they are also working very

* Mechanization engineer, South-Western Divisional Coal Board.

TABLE 1.—*Results Obtained from Power Loading in the South-Western Division.*

| Year. | Overall face o.m.s. (expected pithead). | Average output per machine shift. | Average advance per machine shift. | Average length of face worked. | Average area extracted per machine shift. | Percentage of divisional output power loaded. |
|---|---|---|---|---|---|---|
| | Tons. | Tons. | In. | Yd. | Sq. ft. | |
| 1953 | 3.72 | 171 | 31 | 141 | 1,091 | 2.39 |
| 1954 | 4.41 | 222 | 33 | 121 | 998 | 3.70 |
| 1955 | 4.53 | 154 | 30 | 111 | 833 | 5.32 |
| 1956 | 4.98 | 211 | 38 | 107 | 1,178 | 8.96 |
| 1957 | 5.32 | 231 | 38 | 125 | 1,259 | 14.94 |
| 1958 | 5.27 | 230 | 39 | 127 | 1,224 | 17.70 |
| 1959 | 5.52 | 236 | 34 | 146 | 1,248 | 20.04 |
| Sept., 1960 | 5.57 | 242 | 33 | 148 | 1,221 | 25.71 |

TABLE 2.—*Comparison Between the Performance of the Shearer and the Rapid Plough.*

| Year. | Number of installations. | | Overall face o.m.s. (expected pithead). | | Average output per machine shift. | | Average advance per machine shift. | | Average length of face worked. | | Average area extracted per machine shift. | | Average section worked. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Plough. | Shearers. | Plough. | Shearers. | Plough. | Shearers. | Plough. | Shearers. | Plough. | Shearers. | Plough. | Shearers. | Plough. | Shearers. |
| | | | Tons. | Tons. | Tons. | Tons. | In. | In. | Yd. | Yd. | Sq. ft. | Sq. ft. | Ft. in. | Ft. in. |
| 1953 .. | 3 | Nil | 4.80 | — | 354 | — | 42 | — | 170 | — | 1,785 | — | 3 2 | — |
| 1954 .. | 5 | 1 | 5.70 | 8.28 | 360 | 366 | 40 | 4 | 160 | 120 | 1,651 | 1,620 | 4 0 | 4 8 |
| 1955 .. | 11 | 9 | 4.92 | 5.24 | 301 | 266 | 37 | 37 | 153 | 116 | 1,414 | 1,108 | 4 4 | 4 10 |
| 1956 .. | 12 | 30 | 5.58 | 5.29 | 308 | 243 | 39 | 32 | 155 | 139 | 1,511 | 1,109 | 4 1 | 4 8 |
| 1957 .. | 18 | 46 | 6.01 | 5.49 | 302 | 276 | 40 | 30 | 165 | 148 | 1,709 | 1,110 | 3 9 | 5 4 |
| 1958 .. | 26 | 37 | 5.33 | 5.37 | 266 | 279 | 37 | 31 | 165 | 156 | 1,534 | 1,220 | 3 9 | 5 5 |
| 1959 .. | 35 | 31 | 5.28 | 5.75 | 253 | 288 | 41 | 31 | 154 | 158 | 1,558 | 1,241 | 4 0 | 5 5 |
| Sept., 1960 .. | 53 | 26 | 5.50 | 5.39 | 246 | 285 | 37 | 31 | 154 | 163 | 1,437 | 1,252 | 4 0 | 5 6 |

TABLE 3.—*Comparison Between the Withdrawal of Shearer Loaders and Coal Ploughs.*

| Year. | Average number of power loaders working. | | | Number of power loaders installed. | | | Number of power loaders withdrawn. | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total. | Ploughs. | Shearers. | Total. | Ploughs. | Shearers. | Total. | Ploughs. | Shearers. |
| 1955 | 33 | 11 | 9 | 21 | 8 | 10 | 12 | 2 | 2 |
| 1956 | 62 | 12 | 30 | 63 | 9 | 27 | 34 | 8 | 6 |
| 1957 | 86 | 18 | 46 | 75 | 15 | 28 | 51 | 9 | 12 |
| 1958 | 83 | 26 | 37 | 66 | 20 | 17 | 69 | 12 | 26 |
| 1959 | 91 | 35 | 31 | 75 | 21 | 14 | 67 | 22 | 20 |
| 1960 (Nine months) | 100 | 43 | 27 | 65 | 29 | 13 | 45 | 11 | 18 |

successfully in Somerset. Shearers are mainly confined to the higher volatile coals of the main coalfield, there being none in the anthracite seams. It is planned, however, to try Mawco frames in anthracite coal in the near future.

One of the problems of the mechanization of the South Wales coalfield is that a large number of withdrawals must take place because of the short life of faces, geological disturbances within the expected run, and seam changes, making the power loader totally unsuitable for a period or at all. Table 3 gives some idea of the extent of the withdrawals. It should be remembered that while some of the shearers have been withdrawn because of the large coal problem, plough installations are being extended.

### Ploughing through Geological Disturbances

Ploughing in the division has largely been successful after the first rapid plough was introduced in the Seven Feet Seam at Britannia Colliery in September, 1952. At present these ploughs are either Lobbehobels or Anbauhobels, with the latter associated with BJ-D, Mavor & Coulson, Huwood, or UMM conveyors. The introduction of the hard coal plough with swivelling kerving bits has been beneficial, and most of the installations are now equipped with hydraulic pushers.

Faults and disturbances continue to be negotiated by ploughs, but the degree with which this will take place in the future will be increased. More attention must be paid to the problem of ploughing through disturbed conditions. In all cases spare faces must be equipped and maintained ready for full production. Where standby faces cannot be kept open then much more attention must be paid to the rapid opening out of faces and mechanizing the transport of the equipment to the face as well as installation at the face. Engineers in No. 9 Area, South-Western Divisional Coal Board, have devised a simple frame attachment to enable the complete plough to be assembled at one end of the face and pulled up in stages by a winch at the other end of the face.

When all these techniques are used, however, it still is necessary to plough through faults. There are a number of ways of doing this and the possibilities are as follow:—

(1) Ploughing through the fault, either directly or after blasting the roof or the floor or both (Fig. 1).

(2) Taking a stable ahead of the face in the zone of disturbance and allowing the plough to travel lightly across the stable (Fig. 2).

(3) Using an intermediate return unit (Fig. 3) with or without a drive. Intermediate return units are used if there are faults which the plough cannot negotiate or if the chain interferes with the forward roof supports at the fault. They can be fitted at any point of conveyor. For short faces the return unit without a drive can be used, but the general trend is towards providing power at these units. A return unit can be installed at the face so that part is worked by hand, or a second unit and plough can be used for the rest of the face.

A special light type called the "hooked" return unit (Fig. 4) can be used for short faces, where a hook is attached to an anchor beam or a chain.

FIG. 1.—DIRECT PLOUGHING THROUGH FAULTED CONDITIONS.

FIG. 2.—PLOUGHING THROUGH FAULTED CONDITIONS AFTER TAKING A STABLE AHEAD OF THE FACE IN THE ZONE OF THE DISTURBANCE.

It is a light structure and no driving set can be attached.

The normal type of intermediate drive (Fig. 5) has two vertical pins which connect two straps to the bearing case and side plate. A parallelogram is so formed and the bearing case is forced against the conveyor pan under the pull of the chain. Double return units can be fitted to short plough units instead of a tail-end drive.

Intermediate drives for negotiating faults should not be confused with the central drive unit (system "Walsum") as used for very long faces. These drives consist of two independent plough units of about equal length travelling on one conveyor. This double drive at the face is on the goaf side of the conveyor and not, as in the case of the other, on the face side. No intermediate drives have been so far used in the South-Western Division.

There are now many other types, or variations, of the rapid plough, some of which would appear worthy of trial. There are various forms of short face and pillar ploughs, for lengths of 30 to 40 yd. For pillar extraction, retreat faces, and faces where the roads are driven ahead, this system can be very profitable. Small and simple drives, and in thin seams, smaller conveyors can be used.

The Reisshakenhobel has been developed for thin seam work and has the chain travelling along the goaf side of the conveyor. The chain is attached to the ends of a trapezoidal base plate and slides in a guide which is open at the bottom. Both chains pass through the same guide. The plough itself is small and simple in construction. Drives are on the goaf side. It may have an application in the future, probably in disturbed ground where the chain would be a nuisance or danger on the face side.

The normal plough can be used on gradients to about 1 in 2½ along the face, and even steeper with a stronger anchorage. Special ploughs for steeper faces have been developed. For coals ploughable in the normal way the steep plough can be used where the coal falls away by gravity and the plough is guided by skids. One of the most remarkable ploughs, however, is the ram plough (system Peissenberg, Limited). For steep seams the heavy type body as used at Peissenberg is working very hard coal interbanded with dirt in a seam as thin as 10 in. The drives are installed at each end of the face and the ram body is pulled along by a plough chain. There is a component of dip towards the face. The ram body travels

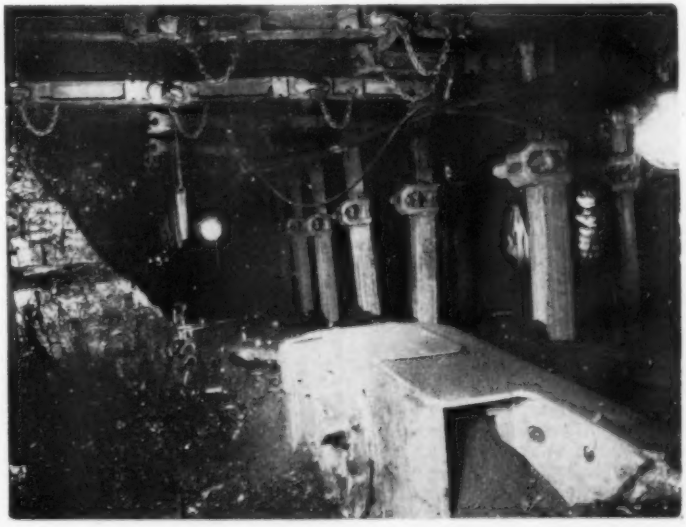

FIG. 3.—INTERMEDIATE RETURN UNIT.

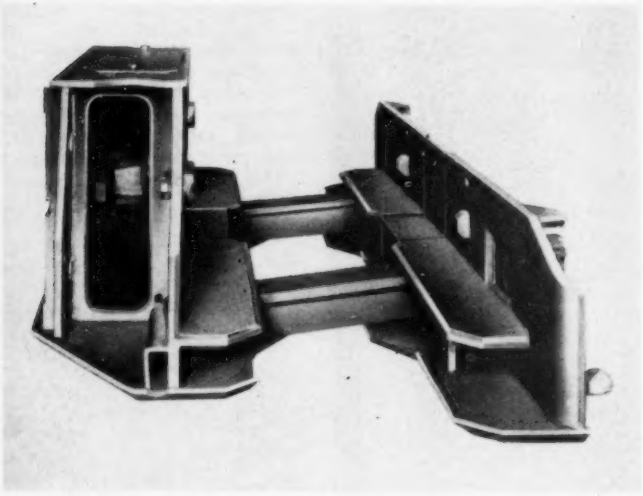

FIG. 4.—"HOOKED" RETURN UNIT.

very rapidly and its eccentric loading breaks off the hard coal.

Should conveying be necessary, ram boxes are fitted.

The hydraulic anchor station is an important development, consisting of, in effect, a powered support, anchorage, and racking over device, for use at the top end of all steep power-loaded faces. One of the Gluckauf type is on order for the South-Western Division. Fig. 6 shows the Dammhobel anchor station.

There are numerous activated ploughs available including, of course, the Huwood Slicer. The Slicer is doing excellent work in various other divisions and should be able to deal with certain conditions encountered in the South Wales coalfield.

**Further Face Mechanization**

In the continued drive for increased mechanization, shearers loaders have to play a considerable part and the downward trend in their use has already been reversed. The conditions for further shearer installations can go into the following categories:—Coking coals; thick seams where small drums can work due to the rest of the seam falling freely; and medium to thick seam using special drums or attachments (including Mawco or Dranyam).

From Table 2 it will be seen that the present average worked section is 5 ft. 6 in., whereas almost all drums are 40 in. dia., *i.e.*, on average, only 60 per cent. of the seam is taken and in no case is further preparation done on the top coal other than a few turret jibs.

The sizing tests at Wyndham Colliery are too well known to be told here, but it should be remembered that the BJ-D 26-pick drum showed very well and later the 23-pick AB drum has shown considerable promise. It is disappointing, however, that at the moment there are no Dranyam attachments working in the division, and that no more Mawcos are in use. So much large coal can be obtained in this way that further installations should be made. Dranyam results at Harworth Colliery and Mawco results at Whitwell are outstanding.

At last the trepanner seems to be coming into use in the South-Western Division. The results at Windsor Colliery are very encouraging. In seam ranges 3 ft. 3 in. to 4 ft. 6 in., product size is normally about half way between the conventional shearer and conventional mining. Above 4 ft. 6 in. there tends to be more degradation because the top coal falls on to the trepanner, or the floor.

There should be more Midget miners at work in South Wales. The machine has proved its worth at Cwmtillery and should shortly go into full production.

FIG. 5.—INTERMEDIATE RETURN UNIT.

While the amount of coal produced by pillar and stall working is only a small percentage of the total divisional output, the importance of the mechanized output, because of its high o.m.s., cannot be over emphasized. The number of Joy loaders is increasing, as is the number of Joy continuous miners. The Goodman 401 miner has just started up and shows considerable promise, and a Wilcox miner has been ordered. We should also follow the progress of the Lee-Norse miner which is due to be installed in another division shortly.

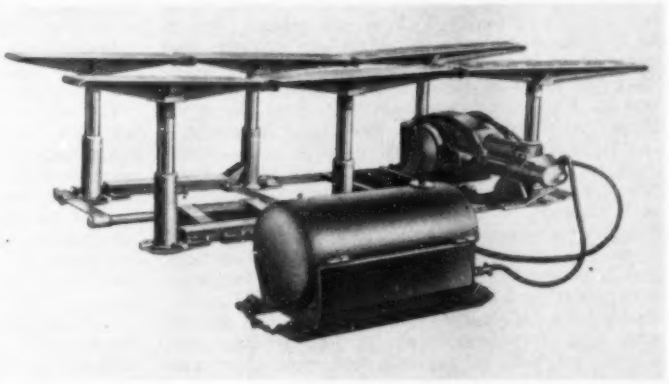

FIG. 6.—DAMMHOBEL ANCHOR STATION.

After two early failures with powered roof supports, due to changing conditions, particularly in relation to the thickness of the seam, a most promising installation is working now on a plough face at Yniscedwyn Colliery, using Dobson Double Two supports. In the near future two Dowty Roofmaster Major and one Dowty Roofmaster Minor installations are planned with the possible use of various other types during 1961.

The degree to which powered supports are introduced will depend largely on the ability of manufacturers to cater for more varying conditions. They will best pay for themselves on rapidly advancing faces, *i.e.*, where one chock does the maximum possible amount of work in 24 hr. There are, however, numerous places where more can be installed. When prop losses of the present order are included in the cost analysis, the argument in favour of the use of powered supports is very strong.

In many cases in the past, power loaders have gone a long way towards further concentration, but the next important and logical step is to have double (in some cases three) shift production of coal. The one factor which enables greater concentration by virtue of having much longer faces (without face transfer points) is, of course, the armoured flexible conveyor. Further concentration is possible in some cases without mechanizing the roadway and stable drivages, but with rapid advances in thin seams, attention to each of these problems is necessary. Stowing presents a real problem in relation to double-shift installations, but attention is drawn to the fact that in the North-Eastern Division a face is working with Dobson Double Two powered-supports and stowing (pipes and shield fitted to supports) working on three shifts and giving a rapid advance.

### Roadway Mechanization

There are various ways of mechanizing roadway drivage. The main ones are:—(1) The driving of a heading to the boundary, opening the face and driving back the other road, leaving a prepared face for retreating; (2) driving roads a certain distance ahead of the face; (3) mechanizing the operation of dealing with the inline ripping, and (4) dinting.

The two main alternatives are whether or not the coal and roof are dealt with simultaneously or separately. In some cases, especially in the thicker seams where it is possible to get about in the coal section only, ripping can follow on later, or at a fixed distance behind. In some cases, ripping follows round for round (or cut for cut) behind the coal getting. Equipment varies, but generally consists of continuous miners, gathering-arm loaders, bucket loaders, or duckbill loaders.

With continuous miners the roads can be very rapidly driven in coal and this can be done in really thin coal with the Wilcox miner. Where the coal is thin, it usually pays to bring the ripping fairly close behind the face to reduce the amount of haulage of debris.

It may well be that small and relatively simple tunnelling machines, probably on the lines of the 40-in. Hughes machine recently tried in a Derbyshire limestone quarry while on loan to the board, may be used for roadway drivages. Where explosives are used, gathering-arm or bucket loaders can be used for loading the coal first and then the stone. The same applies to the Duckbill, of course, but to remove any quantity of materials it is better if the road is rising, and it cannot be dipping.

Where the roads are driven independent of the face, material must be sent to a collecting point, *i.e.*, underground dirt preparation plant, and small ones are worthy of serious consideration especially where the bottleneck is the shaft and winding dirt means winding less coal.

Where, however, roads are a fixed distance ahead of the face, there is the problem of what is to be done with the ripping. Often the easy answer of sending it out of the pit is by no means the best one, especially if there is, as a result, little or no roadside pack. The future efforts must be concentrated (as they are at the moment in the roadways of the national experimental face) on stowing this material in the face. The two main alternatives

here are either the Markham Crusher Stower or a low-pressure stower. With a pre-crusher, say a BJ-D "Stowsizer" or the Markham crusher, the capacity of the crusher stower can be increased from the order of 10 to 15 ton/hr. to between 40 and 50. Experience in Area 9 of the South-Western Divisional Coal Board is that the "Stowsizer" can take care of really hard rock.

More attention is being paid to the use of low-pressure stowers with their own blower unit for this sort of work. Recent tests carried out at the Penallta experimental station with an Atlas Copco Type U 18 blower, and a Brieden KZS 50 vertical paddle stower were encouraging. The blower, with a capacity of 2,250 cu. ft./min. at 15 lb./sq. in. enabled 80 cu. yd./hr. throughput of the stower and, after travelling 30 ft., turning 90 deg. and travelling 150 ft. further in a 6-in. pipe, there was a 20-yd. straight trajectory at the face.

Far more work needs to be done in these fields, but the technique of completely mechanized roadway drivage ahead of the face must be the next important step in further mechanization. Where it is planned to keep rippings in line with the roadside pack, the most advanced developments at the moment are the Peake ripping machine and the Rippon. Mr. C. Peake has adequately described his machine to this association, as also has Mr. C. J. Moss. Ultimately, with self propulsion and means of making the pack, it will be an important machine for this work.

The Rippon, produced primarily by Mr. C. G. Heathcote in Area 3 of the East Midlands Division, consists of a self-advancing container unit which holds the debris from the lip and feeds into both packholes as required. It also acts as a protective shield to persons passing on and off the face as well as safeguarding the conveyor equipment and power lines. Various means can be used for putting the dirt into the packhole. It can now be constructed with either 25-ton or 50-ton jacks in the forward platform and the machine normally works from a lowered height of 30 in. to a raised height of 61 in., although a new low-seam machine is being designed where the platform can be lowered down to 1 ft. 6 in.

### Stable Hole Mechanization

Much has been said about stable hole mechanization, and much more needs to be done, but a development of great promise is the Dawson-Miller machine. It consists of a short conveyor on which is mounted a motor gearbox unit which can traverse backwards and forwards along the length of the conveyor. The gearbox drives a "segmented wheel" on the ends of each arm there being a shearer pick, and this rotates at high speed as it is traversed along the conveyor. The conveyor is driven by a separate motor and gearbox and by suitable linkages, the conveyor drive is utilized to traverse the cutter unit backwards and forwards. The whole unit is advanced continuously by two hydraulic rams as cutting proceeds. The cut coal is conveyed to the middle of the machine and loaded on to a portable hydraulic conveyor which then delivers on to the stage loader. The machine takes a web of $\frac{3}{4}$ in. deep.

Following trials underground with a 12-ft. long prototype, a 42-ft. long machine has been developed, and early trials are encouraging.

The approach to automation can be made, in the view of the NCB's Automation Committee, by a system that neither uses longwall nor room-and-pillar methods of working. The Durham continuous miner, envisaged by Mr. H. E. Collins, is the basis of the new machine. Equipped with a launching platform and carrying its own supports forward, as well as its conveyor, the prototype machine has already shown great promise, and on one trial advanced 33 ft. in a drivage 6 ft. 6 in. wide by 1 ft. 6 in. high in about 20 min. giving a rate of advance of $2\frac{1}{2}$ ft./min. So far the maximum depth achieved has been 38 yd. with the Collins miner. The new one is designed to advance 100 yd.

New aids must be tried where necessary. For the face these include the conveyor lifter, which can jack the conveyor vertically from the goaf side, the shorter plough base, deep-hole infusion, gamma ray steering of some machines (as with the New Lount Midget miner, etc.). Outbye, clearance problems can be aided in many cases by the use of bunker conveyors of about 100 tons capacity near pit bottoms or 30 to 50 tons in districts, or even in washery plants.

Increased use of mechanized methods of collection of supplies with packaging systems is needed. An overhead crane in the pit bottom is now standard equipment in the Ruhr, and monorail systems are very common. This division has advanced more rapidly than any other with the installation of overhead rail type monorails. A short while ago 12 Becorit monorails were working in the division, the average length of which was 700 yd. Mostly used in gate roads, they are useful also for withdrawing equipment from finished districts.

One of the greatest difficulties, especially where a very high percentage of the colliery output is obtained by concentrated mechanization, occurs when some form of geological disturbance is met by a mechanized face. The more disturbed areas of the coalfield are now being mechanized and the problem will become more acute.

Retreating faces go a long way towards solving this problem, but where they are not possible, we must search for other aids. Standbye faces to take over the main production are vital, even if they have to be kept at a low level of production. Roadways ahead of the face help to provide an early warning of approaching geological disturbances. In some cases, it will be preferable to have what amounts to a series of development faces at intervals, until, in effect, an area permitting a number of future faces has been proved.

Attention must be paid to more mechanized means of development. There will generally be no place for short slowly advancing conventional development faces. Completely mechanized narrow drivages will be best and if, as in the past these have been avoided because the dirt could not be dealt with, then an underground dirt-preparation

plant will be necessary. Otherwise fully mechanized faces will be preferable. It may be that in the latter case, shorter faces with powered supports, mechanized roadways, and stables playing an even more important part may be the answer.

### Conclusion

To allay any doubt about the capabilities of coal ploughs, I ask people to remember a few figures. Writhlington is an old colliery in Somerset with the winding engine house on one side of a public highway and the shaft on the other. Numerous seams have been worked and the No. 10 Seam is now the subject of concentration. It is about 3 ft. 9 in. thick, with a reasonably good floor and roof, but, of course, liable to the sort of geological disturbances expected from this coalfield. Prior to the installation of the first plough, at a face 154 yd. long during April, 1960, the colliery o.m.s. (average for 1959) was 15 cwt. and the pit was in danger of being closed. The plough was successful from the start and by May, 1960, when the plough was producing 55 per cent. of the colliery output, the plough face o.m.s. was 144 cwt. and the colliery o.m.s. 30.4 cwt. A second plough on a face of the same length and conditions started in July, 1960, and went as well as the first. For week ended November 5, 1960, the two produced 99.6 per cent. of the colliery output at face o.m.s. figures of 9.3 and 9.2 tons, giving an overall colliery o.m.s. of 50.9 cwt. (O.m.s. figures are all expected pithead.) The average conventional face o.m.s. for 1959 was 40 cwt.

I would like to expres my thanks to Mr. G. S. Morgan, production director, South-Western Divisional Coal Board, for permission to present this paper. The views expresed are those of the author and not necessarily those of the board.

# RIPPING SURFACE ROCK

CLAIMED to be the first time that tandem ripping had been demonstrated to the quarry industry in Great Britain, surface rock-ripping with tractors was demonstrated by Bowmaker (Plant), Limited, Birmingham 16, at the Merehead Quarry, near Shepton Mallet (Som), of Foster Yeoman, Limited, recently. The machines used, two power-shift D9 tractors fitted with hydraulically operated bulldozers and Caterpillar and Kelley hydraulic rippers, operated in limestone bed-rock.

Bowmaker has pioneered this work using carefully applied methods of testing, surveying, and costing. Three years ago, the Caterpillar Tractor Company introduced the refraction seismograph to measure the overall consolidation of subsurface materials.

The seismograph can indicate whether the formation can be ripped, the equipment which will be required, and the rate of production which can be obtained. When ripping, the tractor lowers the ripper into the rock to the depth it is able to maintain in the hardest areas. The tooth is lifted clear, the tractor turns, starts another run until the area has been ripped, and then repeats the process.

The ripped rock is either dozed over the face, dozed to stock, or picked up direct by traxcavator or scraper. A 3-in. thickness of ripped material should be left in order to provide traction on the next ripping phase and to cushion the tractor.

During the test the downward pressure of a single hydraulic ripping blade was 40,000 lb. and the tractive force available was 104,000 lb. Inspection of stone revealed some slightly crystalline parts with the presence of some chert. There is an area too dense for single ripping and one or two parts resistant to tandem ripping. The crushing strength of the stone varies from 27,000 lb./sq. in. to over 30,000 lb./sq. in.

The principle of seismic analysis is based on the fact that seismic waves travel through subsurface materials at varying velocities, depending on their degree of consolidation. When the seismic test was made, there was evidence of some fissures and faults. The velocity of the seismic waves through the carboniferous limestone was 5,400 ft./sec.

TANDEM RIPPING WITH TWO CATERPILLAR D9 TRACTORS. THE FORWARD MACHINE IS EQUIPPED WITH A CATERPILLAR No. 9 RIPPER AND THE REAR IS FITTED WITH A KELLEY RIPPER.

# Forthcoming Events

MARCH 20

*Institution of Production Engineers (Leeds Section)*:—Meeting at the Hotel Metropole, King Street, Leeds 1, at 7.30 p.m. "Work Study," by G. A. Daniell, preceded by the annual general meeting at 7 p.m.

*Institution of Production Engineers (Newcastle-upon-Tyne Section)*:—Annual general meeting at Gateshead Technical College, Durham Road, Gateshead 9, at 6.45 p.m., followed by the chairman's address at 7 p.m. and a tour of the college workshops and laboratories.

*Institute of Marine Engineers (South Wales Section)*:—Meeting at the South Wales Institute of Engineers, Park Place, Cardiff, at 7 p.m. "Details and Operating Data of Recent a.c. Installations," by A. N. Savage.

MARCH 21

*Institution of Chemical Engineers*:—Meeting at the Geological Society, Burlington House, Piccadilly, London, W.1, at 5.30 p.m. "Some Factors in the Safe Operation of Air Separation Plants," introduced by J. B. Gardner.

*Institution of Production Engineers (Stoke-on-Trent Section)*:—Joint meeting with the Institute of Personnel Management at Pitfield House, Newcastle-under-Lyme, at 6.30 p.m. "Management, Selection, and Training," by F. W. Tymdale.

*Institution of Mechanical Engineers*:—Meeting at the Engineering Laboratory Lecture Theatre, University of Bristol, at 7 p.m. "Blade Profiles for Axial Flow Fans, Pumps, Compressors, etc.," by Prof. A. D. S. Carter.

MARCH 21-25

*Electrical Engineers (ASEE) Exhibition*:—Earls Court, London, S.W.5, 10 a.m. to 7 p.m. (March 22, 10 a.m. to 9 p.m.).

MARCH 22

*Royal Society of Arts*:—Meeting at John Adam Street, Adelphi, London, W.C.2, at 6 p.m. "Economic and Commercial Aspects of the Steel Industry," by Sir Robert Shone, executive member, Iron and Steel Board. Applications for tickets to the secretary of the RSA.

*Society of Instrument Technology (Tees-side Section)*:—Meeting at the Cleveland Scientific and Technical Institute, Corporation Road, Middlesbrough, at 7.30 p.m. Annual general meeting, followed by "Some Impressions of Instrumentation in the USSR," by E. N. Martin.

*Institution of Electrical Engineers (South-West Scotland Sub-Centre)*:—Meeting at 39, Elmbank Crescent, Glasgow, C.2, at 6 p.m. "A General Theory of Depreciation of Engineering Plant," by D. Rudd.

*Institution of Mechanical Engineers*:—Meeting at 1, Birdcage Walk, Westminster, London, S.W.1, at 6 p.m. James Clayton Lecture: "The Bearings of Psychology and Medicine upon Engineering," by Sir Frederic Bartlett.

MARCH 23

*Coalville Mining and Technical College*:—Meeting of the Mining Society at 6.30 p.m. "Reinforced Concrete in Mining," by C. A. C. Davies, chief civil engineer, National Coal Board, and film on the sinking of Parkside Colliery.

*Institute of Marine Engineers (Kingston-upon-Hull and Humber Area Section)*:—Meeting at the Royal Station Hotel, Kingston-upon-Hull, at 7.30 p.m. "Details and Operating Data of Recent a.c. Installations," by A. N. Savage.

*Society of Instrument Technology (Chester Section)*:—Meeting in the Lecture Theatre, Administration Building, Associated Ethyl Company, Limited, Oil Sites Road, Ellesmere Port, Wirral, at 7 p.m. "Electromagnetic Flowmeters," by L. M. Bennett.

MARCH 24

*Swansea College of Technology Mining Society*:—Annual dinner at the Mackworth Hotel, Swansea, at 7.15 for 7.30 p.m.

*North East Coast Institution of Engineers and Shipbuilders*:—Meeting at the Mining Institute, Newcastle-upon-Tyne, at 6.15 p.m. "Fuel Cells," by Dr. H. H. Chambers.

*Wigan and District Mining and Technical College (Past and Present Mining Students' Association)*:—Annual dinner and dance at Haigh Hall, Wigan.

*Society of Instrument Technology (Cheltenham Section)*:—Meeting at the Belle Vue Hotel, Cheltenham, at 7.30 p.m. "The Measurement of Vibration."

*West of Scotland Iron and Steel Institute*:—Meeting at 39, Elmbank Crescent, Glasgow, C.2, at 6.45 p.m. Symposium on "Heat Treatment."

MARCH 25

*Royal Institution of Chartered Surveyors*:—Mining surveyors' general meeting at 7, Manor Place, Edinburgh 3, at 9.45 a.m. "Scottish Developments in the Mining Industry," by Prof. R. McAdam, of the Heriot-Watt College, Edinburgh.

MARCH 27

*Institution of Production Engineers (Manchester Section)*:—Annual general meeting at the Manchester College of Science and Technology at 6.30 p.m., followed by "Electrified Railway Freight Handling Systems," by G. R. Higgs.

MARCH 28

*Combustion Engineering Association (North Western Region)*:—Meeting at the Bull and Royal Hotel, Fishergate, Preston, at 7.15 p.m. "Industry and the Clean Air Act," by Dr. J. S. G. Burnett, medical officer of health, Preston.

*South Staffordshire and Warwickshire Institute of Mining Engineers*:—Meeting at the Swan Hotel, Lichfield. "Ball Clay Mining in South Devon," by C. L. Booth, HM District Inspector of Mines and Quarries, and W. J. Bloor, manager, Watts, Blake, Bearne & Company, Limited.

*Institution of Mechanical Engineers (South Wales Branch)*:—Meeting at the South Wales Institute of Engineers, Park Place, Cardiff, at 6 p.m. "The Diesel Engine in Association with the Gas Turbine," by E. Chatterton.

*Institute of Marine Engineers (North East Coast Section)*:—Meeting at Stephenson Building, King's College, Claremont Road, Newcastle-upon-Tyne, at 6.15 p.m. "Materials for Advanced Steam Conditions and Their Influence on Operation of Turbines and Boilers," by Cdr. H. E. C. Hims and S. H. Frederick.

MARCH 29

*Combustion Engineering Association*:—Meeting at the Criterion Restaurant, Piccadilly Circus, London, W.1, at 2.15 p.m. "Modern Developments in Water Tube Boiler Design," by Dr.-Ing. Heinrich Vorkauf.

*Institution of Mechanical Engineers*:—Meeting at 1, Birdcage Walk, Westminster, London, S.W.1, at 6 p.m. "An Experimental Study of the Flow Conditions and Pressure Drop of Steam-water Mixtures at High Pressures in Heated and Unheated Tubes," by R. W. Haywood, C. A. Knights, C. E. Middleton, and J. R. S. Thom.

MARCH 30

*Institution of Mechanical Engineers (Eastern Branch)*:—Meeting at the Diocesan Hall, Ipswich, at 7.30 p.m. "Common and Uncommon Causes of Failure of Plant in Service," by G. A. Cottell.

*Institution of Mechanical Engineers (East Midlands Branch)*:—Meeting at the Technical College, Lincoln, at 7.15 p.m. "Powder Metallurgy Applications," by B. H. Swan.

## National Association of Colliery Managers

MARCH 20

*Midland Branch*:—Meeting at the Denman's Head Hotel, Sutton-in-Ashfield, at 5.30 p.m. "Methane Drainage," by W. E. Vance, ventilation engineer, No. 3 Area.

MARCH 22

*Lancashire Branch*:—Meeting at 40, Portland Street, Manchester. Discussion on "Methods of Roof Support in View of Impending New Regulations."

*North of England Branch*:—Meeting at the Mining Institute, Newcastle upon Tyne, at 6.45 p.m. "A Study of the Converter-driven Four-rope Friction Winders at the Theresa and Castlereagh Shafts, Dawdon Colliery," by D. L. Hunt.

MARCH 24

*Yorkshire Branch*:—Dinner and dance at the Danum Hotel, Doncaster.

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OVER 350 FIRMS from 13 countries have so far arranged to display their products at this year's International Plastics Exhibition at Olympia, London, from June 21 to July 1. Full details about the exhibition can be obtained from Iliffe Exhibitions, Limited, Dorset House, Stamford Street, London, S.E.1.

# RUSSIAN BLAST FURNACE

# *of 1,719m³. Working Volume*

## *Blowing-in and Initial Working Period*

*A description is given below of the blowing-in and initial working period of a large new Russian blast furnace (working volume 60,680 cu. ft.), which is understood to be at the Petrovsky Works in Dnepropetrovsk, but this is not stated in the original article in Metallurg (1960, V, No. 7, pp. 7-9) by B. N. Starshinov, N. I. Savelov, D. A. Tarasov, I. E. Suprun, Ya. S. Gorbanev, and S. T. Pliskanovskii, of which this is a translation.*

A START was made with charging the newly constructed blast furnace during the night of August 27, 1959. The composition of the burden for blowing-in the furnace is shown in Table 1.

TABLE 1.—*Composition of the Blowing-in Burden* in Relation to Charges (tons).*

| Charge numbers. | Iron ore. | Manganese ore. | Granulated slag. | Fluxes. | Ratio of ore and flux charged to coke. | Ratio of ore charged to coke. |
|---|---|---|---|---|---|---|
| 1–15 | — | — | — | — | — | — |
| 16–24 | — | — | 3.0 | 1.35 | 0.435 | 0.300 |
| 25–63 | 3.35 | — | 3.0 | 2.90 | 0.925 | 0.635 |
| 64–70 | 4.30 | — | 3.0 | 3.30 | 1.060 | 0.730 |
| 71–76 | 5.00 | — | 3.0 | 3.70 | 1.170 | 0.800 |
| 77–82 | 5.90 | — | 2.5 | 3.95 | 1.235 | 0.840 |
| 83–88 | 7.15 | — | 2.5 | 4.55 | 1.420 | 0.965 |
| 89–93 | 9.0 | 0.10 | 1.0 | 5.25 | 1.535 | 1.100 |
| 94–98 | 12.2 | 0.25 | 0.5 | 6.70 | 1.965 | 1.295 |
| From 99 onwards | 14.7 | 0.35 | 0.5 | 7.90 | 2.345 | 1.555 |

* The coke charge was 10 tons.

The charge was loaded in accordance with an ore-ore-coke-coke-coke rotation. At 4 p.m. on August 28 the furnace was blown-in with a blast of 1.3 atm. pressure and 750 to 800 deg. C. temperature.

After a few minutes the coke was ignited in front of the tuyeres, after which the blast pressure was reduced to 0.5 atm., the blast temperature was set at 600 deg. C. and its consumption at 1,300 m³/min. (46,000 cu. ft./min.). From 8 p.m. delivery of blast furnace gas to the gas-cleaning plant was started; the temperature of the blast was raised to 700 deg. C., and from 9 to 10 p.m. up to 800 deg. C. and the consumption of blast was increased to 1,500 m³/min. (53,000 cu. ft./min). In this shift the materials were charged into the furnace in a rotation of two ore charges totalling 10 tons followed by three coke charges totalling 10 tons to a stockline level of 1.5 m. (5 ft.).

An hour and a half after blowing-in the $CO_2$ and CO contents in the blast-furnace gas were, respectively, 2.6 and 36.6 per cent. and at 7.30 p.m. 7.1 and 32.9. per cent. The hydrogen content varied within the limits of 2.1 to 2.7 per cent. At 10 p.m. the $CO_2$ content increased to 9.4 per cent., and the CO content decreased to 33.0 per cent.*

During the course of the first two shifts on August 29 the blast consumption was increased to 2,200 m³/min. (78,000 cu. ft./min.), the top pressure was raised to 0.19 atm., and at 4 p.m. the top temperature exceeded 420 deg. C. From 4 p.m. the quantity of iron ore in the charges was increased to 15.5 tons,† of the manganese ore to 0.5 ton, and of the fluxes to 8.2 tons, while charging of the granulated slag ceased.

At 3.30 a.m. the iron notch was burnt out, and two-thirds of a ladle of slag were drawn off with a basicity of 1.16 ($CaO:SiO_2$) and a content of 1.12 per cent. MnO and 0.59 per cent. FeO. There was

* The CO content at 10 p.m. does not show a decrease in the figures taken from the Russian article, one of which is apparently a misprint.—Metallurgical Editor.

† Metric tons throughout.

TABLE 2.—*Composition of Pig-iron and Slag, per Cent.*

| Periods. | Pig-iron. | | | Slag. | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Si. | Mn. | S. | $Al_2O_3$. | FeO. | MgO. | $\frac{CaO}{SiO_2}$ | MnO. | S. |
| I | 3.14 | 1.06 | 0.041 | 8.45 | 0.37 | 3.46 | 1.20 | 0.62 | 2.13 |
| II | 2.54 | 0.92 | 0.046 | 8.11 | 0.49 | 7.04 | 1.14 | 0.59 | 2.12 |
| III | 2.45 | 1.02 | 0.035 | 8.03 | 0.53 | 6.75 | 1.18 | 0.61 | 2.26 |
| IV | 3.11 | 1.04 | 0.033 | 8.53 | 0.44 | 7.04 | 1.15 | 0.57 | 2.12 |
| V | 2.71 | 0.98 | 0.050 | 8.87 | 0.42 | 7.08 | 1.16 | 0.58 | 2.25 |
| VI | 3.02 | 0.99 | 0.33 | 9.19 | 0.52 | 6.82 | 1.18 | 0.48 | 2.34 |
| VII | 2.50 | 1.09 | 0.038 | 7.99 | 0.49 | 6.24 | 1.18 | 0.57 | 2.38 |
| VIII | 0.69 | 1.94 | 0.074 | 10.36 | 0.57 | 2.78 | 1.16 | 3.19 | 2.02 |

no pig-iron ready to tap. The first pig-iron (1.78 per cent. Si, 0.17 per cent. Mn, 0.278 per cent. S) was tapped between 6.30 a.m. and 7.15 a.m. on August 29. Simultaneously, a third of a ladle of slag was tapped with basicity of 1.19 and a content of 1.17 per cent. MnO.

Between 2 and 3 p.m. the Si in the pig-iron increased to 5.6 per cent., and the sulphur content decreased to 0.115 per cent. The basicity of the slag was 1.31. After this the chemical composition of the pig-iron became steady: 3.45 to 3.85 per cent. Si; 0.85 to 1.0 per cent. Mn, and 0.04 to 0.05 per cent. S, while the slag had a basicity of 1.17 to 1.23.

From August 30-31 we started to increase the top pressure and the temperature of the blast, and by September 7 they were, respectively, 1.0 atm. and 850 to 900 deg. C. The blast consumption was also increased to 3,000 m³/min. (106,000 cu. ft./min.). Until September 5 the system of charging the materials into the furnace was not changed, and then a start was made with charging according to a coke-ore-ore-coke-coke system, while the stockline level and the weight of the coke charged remained the same.

Since basically lean ores entered into the burden (iron content of the ferruginous part of the burden 50.0 per cent.), the yield of slag was high: 1,265 to 1,270 kg./ton (1.25 ton/ton) pig-iron. During the first period the consumption of Kamyshburunsk sinter with a basicity of 0.6 formed only 3.0 to 3.5 per cent. of the ferruginous part of the burden.

The chemical composition of the pig-iron tapped is given in Table 2, and the operating data for each period in Table 3. The average contents of silicon and manganese changed little. The peiods of operation of the blast furnace were essentially differentiated by the composition of the burden, and consequently also by the content of phosphorus in the pig-iron in individual instances.

In periods I to IV foundry pig-iron was tapped with a phosphorus content up to 0.3 per cent., in periods V to VII up to 0.6 to 0.7 per cent., and in November (period VIII) the blast furnace was changed over to tapping phosphoric pig-iron.

In period II, by comparison with period I, the quantity of sinter in the ferruginous part of the burden was increased to 9 per cent., and 16 per cent. iron-ore grade 20 was introduced. The materials were charged in a cycle of five charges, of which there were two to three charges of ore at the start.

Although the iron content of the burden was unchanged, due to an improvement in the quality of of dolomitic limestone and a change in the composition of the burden, and also due to an increase in the top pressure and in the temperature of the blast, the rate of smelting in the blast furnace and the ore burden were increased, which led to a rise in output and a fall in the coke rate.

In period III the quantity of sinter was reduced to 6.5 per cent., the consumption of 20 grade ore was increased to 19.5 per cent., and the consumption of metallic additions was also increased. The top pressure was raised to 1.3 atm. As a result of all this the output of the furnace rose, but the coke rate

TABLE 3.—*Figures for the Working of the Blast Furnace from the Start of Working.*

| Periods, 1959. | | | Blast. | | | | Consumption of raw materials, kg./ton pig-iron. | | | | | | | | | | | | | | Iron content of ferruginous part of burden, per cent. | Yield of slag, kg./ton pig-iron. | Utilization factor, m.³/ton/day.* | Rate, kg./m³/day. | | Ratio of ore charged to coke charge, ton/ton. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Sinter. | | | | Iron ore. | | | | | | | Limestone. | | | | | | | | | |
| Number. | Start. | Finish. | Consumption, m.³/min. | Temperature deg. C. | Humidity, g/m³. | Top pressure, atm. | Top temperature deg. C. | VaGOK. | Local. | Kamyshburunsk. | 20 Grade. | Mixed. | Limonite. | Manganese ore. | Hearth cinder. | Scrap and mill scale. | Coke. | Ordinary. | Dolomite. | | | | | Of coke-combustion. | Of smelting of ores and fluxes. | |
| I | 30/VIII | 6/IX | 2,585 | 841 | + | 0.51 | 275 | — | — | 71 | — | 2,047 | — | 60 | — | — | 1,308 | 834 | 310 | 50.0 | 1,269 | 1,530 | 742 | 1,887 | 1,667 |
| II | September 7 | 15 | 3,070 | 881 | 18 | 1.17 | 298 | — | 48 | 139 | 335 | 1,538 | — | 51 | — | 23 | 1,227 | 558 | 553 | 50.0 | 1,264 | 1,283 | 831 | 2,187 | 1,720 |
| III | 16 | 21 | 3,180 | 877 | 14 | 1.28 | 303 | — | — | 126 | 376 | 1,384 | — | 53 | — | 98 | 1,245 | 535 | 538 | 51.2 | 1,217 | 1,167 | 930 | 2,291 | 1,551 |
| IV | 22 | 26 | 3,210 | 932 | 15 | 1.29 | 325 | — | — | 141 | 372 | 1,369 | — | 47 | — | 107 | 1,234 | 512 | 503 | 50.7 | 1,232 | 1,059 | 985 | 2,399 | 1,583 |
| V | 27 | 2/X | 2,920 | 937 | + | 1.27 | 317 | — | — | 421 | 439 | 916 | — | — | — | 71 | 1,135 | 502 | 352 | 50.2 | 1,086 | 1,125 | 879 | 2,086 | 1,560 |
| VI | October 3 | 16 | 2,890 | 924 | do | 1.30 | 347 | 592 | 11 | 490 | 467 | 333 | — | 1 | 3 | 15 | 1,112 | 327 | 317 | 51.0 | 916 | 1,092 | 964 | 2,202 | 1,704 |
| VII | 17 | 31 | 3,010 | 905 | 16 | 1.39 | 311 | 723 | — | 570 | 439 | 192 | — | — | 3 | 25 | 998 | 369 | 297 | 50.5 | 930 | 0.921 | 942 | 2,193 | 1,932 |
| VIII | November 1 | 20 | 2,845 | 972 | 23 | 1.36 | 304 | 41 | 407 | 1,306 | 6 | 27 | 154 | 25 | 16 | 6 | 789 | 386 | — | 47.1 | 879 | 0.813 | 970 | 2,037 | 2,512 |

* Converted in relation to conversion pig-iron. † Natural.

increased slightly. The system of charging the materials remained the same in periods III to VI as in period II.

The further improvement in the blast-furnace smelting figures in period IV was obtained at the expense of a certain increase in the consumption of Kamyshburunsk sinter and an increase in the temperature of the blast to between 925 and 950 deg. C.

With the change over to the smelting of phosphoric, foundry pig-iron at the end of September, 1959 (period V) the quantity of Kamyshburunsk sinter in the ferruginous part of the burden was increased to 24 per cent., and of grade 20 ore to 25 per cent., while the consumptions of dolomitic limestone and metallic additions were lessened. As a result, the iron content of the burden fell by 0.5 per cent., but the yield of slag was also diminished, since on increasing the proportion of sinter in the burden the supply of manganese ore was cut out.

The necessary quantity of manganese was introduced into the pig-iron by means of the sinter. With the reduction in the consumption of dolomitic limestone by 30 per cent., the quality of the slag deteriorated somewhat, which led to a reduction in the smelting rate of the blast furnace.

In October (period VI) the quantity of sinter was increased to 58 per cent., by introducing into the ferruginous part of the burden YuGOK sinter and local sinter. During this period the iron content of the burden rose somewhat, and the yield of slag was decreased, although the consumption of metallic additions fell. This brought about a considerable improvement in the figures for the working of the furnace—the output rose, while the coke rate fell.

In the second half of October (period VII) the top pressure was increased to 1.4 to 1.5 atm. and the blast temperature to 1,000 deg. C. This permitted an increase in the output of the blast furnace (the coefficient of utilization of the working volume recalculated in relation to phosphoric pig-iron was 0.92 cu. m./ton (32.5 cu. ft./ton) pig-iron per day and a reduction in the coke rate to 998 kg./ton (0.98 ton/ton) pig-iron. In this period the charge materials were loaded in a basic cycle of four charges, one of which was an ore charge at the start.

The figures given for the working of the blast furnace for the smelting of foundry pig-iron were obtained during a total of one and a half to two months after blowing-in.

In November (period VIII) the blast furnace was switched over to the smelting of phosphoric pig-iron with an average phosphorus content of 1.58 per cent.

The composition of the ferruginous part of the burden was:—Kamyshburunsk sinter, 66 per cent.; local sinter, 21 per cent.; YuGOK sinter, 2 per cent., and remainder limonite and other ferruginous ores. Dolomitic limestone was completely excluded from the burden.

The technical operating conditions of the working of the blast furnace in all the periods are shown in Table 3.

In period VIII, on account of the considerable increase in the proportion of Kamyshburunsk sinter, the iron content of the burden fell, but the yield of slag per ton pig-iron was somewhat decreased.

With the changeover to the smelting of phosphoric pig-iron the ore burden was increased to 2.5 ton/ton coke, and the smelting rate of the raw materials was 2.94 ton/cu. m. (0.083 ton/cu. ft.) per day. Under these conditions the blast furnace men achieved a utilization factor of only 0.813 cu. m. working volume/ton (29 cu. ft./ton) pig-iron per day at a coke rate of 0.789 ton/ton pig-iron.

Judging by these results, it may be considered that the blowing-in of the furnace was carried out entirely satisfactorily. Over a comparatively short period of time (one and a half to two months) a top pressure of 1.4 to 1.5 atm. was attained, a blast temperature of 1,000 deg. C., a smelting rate of the raw material of 2.2 ton/cu. m. (0.062 ton/cu. ft.) per day for foundry pig-iron and 2.9 ton/cu. m. (0.083 ton/cu. ft.) per day for phosphoric pig-iron.

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# SHARP-FACED FOUNDRY PATTERN LETTERS

SUCCESSFUL introduction of Polythene pattern letters for the foundry trade by A.E.I. Plastics (Aldridge), Limited, is now followed by a new range of sharp-faced pattern letters for the small sizes (below ½ in.) which have the advantage of producing an improved impression on all types of castings. In common with the range of larger pattern letters, the new type is only half the price of equivalent metal characters, yet maintains all the advantages.

Polythene characters are extremely resilient—direct hammer blows cause only momentary distortion and the most rigorous hand or machine ramming is withstood without burring. The irritating and often costly waste of time that occurs through damaged lettering on a moulding (only discovered when the moulding has been withdrawn) is thus eliminated.

In addition, Polythene has good "non-stick" properties and the useful characteristics associated with lead. It is pliable and can be easily moulded to any contour; it can be pinned or glued to a pattern without difficulty, and it is unaffected by water. The characters are normally supplied in light grey to contrast with the conventional red, yellow, and black used for pattern identification.

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PRODUCTION OF bituminous coal and lignite in the US during January, according to the Bureau of Mines, US Department of the Interior, was 31,420,000 net tons, compared with 31,885,000 net tons in the previous month and 36,110,000 net tons in January, 1960.

# *Coal for Petrol Manufacture*

COSTS are an important factor at Sigma Colliery, the largest mechanized mine in Africa, since the output is used to produce high-grade petrol at economic cost for the plant operated by Suid-Afrikaanse Steenpool, Olie en Gaskporasie Berperk (SASOL), which is sponsored and financed by the South African Government. Some 50,000 tons of coal per week is produced at the colliery and is supplied to the petrol production plant by a 4-mile long belt conveyor system. The total staff, including surface and underground workers, is composed of 90 Europeans and 500 natives. The reserves, according to the December 9, 1960, issue of the South African Mining and Engineering Journal, are estimated to be sufficient for 100 years' mining.

Access to the working is by drift with an inclination of 18 deg. and 10 main development roads, which are protected by 12-ft. barriers of coal. At 5,000-ft. intervals along each main road seven subsidiary roads, similarly protected by barriers, are driven to form blocks of coal measuring approximately one mile square. Each block is divided into panels approximately 1,000 ft. by 2,000 ft., there being 10 panels within a block.

Within each panel, bord-and-pillar mining is practised, with roads 20 ft. wide and at 70-ft. centres. The average working height is 10 ft. Seven faces constitute a section, which is worked with a Universal coal cutter, a mechanical loader, three battery-driven shuttle cars of 6½-ton capacity, a two-drill roof bolting machine, and a belt feeder. Each section, with 28 native operators under the direct supervision of one qualified European, produces 1,000 tons per shift.

Coal is loaded into the shuttle cars at the rate of 10 ton/min. and is transported between 300 and 500 ft. to a point where it is unloaded on to a belt feeder, which feeds onto a gathering belt conveyor. The belt feeder is an important item in the transport system as it controls the peak loads, which eventually reach the trunk system.

From the 36-in. gathering conveyor, the coal is fed onto a 42-in. panel conveyor which is capable of carrying 280 ton/hr. at 280 ft./min. From the panel conveyors, the output is delivered onto 48-in. section conveyors, which feed the 48-in. trunk conveyors to the bottom of the drift. Coal is conveyed up the drift at the maximum rate of 650 ton/hr. at a speed of 400 ft./min. and is delivered into a surface bunker with a capacity of 7,000 tons.

Transport costs, by conveyor, including operation, maintenance and redemption of capital, are 1d./ton mile.

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THIS YEAR'S Laboratory Apparatus and Materials Exhibition will be held at the Royal Horticultural Society's New Hall, London, from June 19 to 22. The organizers are UTP Exhibitions, Limited, 9, Gough Square, Fleet Street, London, E.C.4.

# CLAMP FOR SETTING FRICTION PROPS

DEVICE to help in the setting of friction props of the tubular clamp ring type has been invented by Mr. William Cook, overman at Lady Victoria Colliery in the Lothians Area of the Scottish Divisional Coal Board. Tests have proved successful and the device can easily be adapted for use with any other type of friction prop. In workings up to 6 ft. high, or perhaps a little less in the case of very steep workings, the device enables props to be set up by one man. In a thicker seam two men may be required to lift the prop and insert it in the clamp, but only one man would be required thereafter for the actual setting.

The device consists of a strip of metal 1-in. by ¼-in. section bent into U form such that it fits round the top of a friction prop just below the prop top. Hooks are welded to this U so that they clear the prong top to enable the device to be suspended from the bottom flange of the roof bar.

In operation, the bracket is slipped along the bar from the pointed end to a position close to the proposed prop position. The upper member of the prop is lifted until the prongs engage in the location points of the bar, and the bracket is slipped along so that the prop top is gripped in the U part, thus suspending the prop in position. The prop may then be set finally by driving in the setting and locking wedges.

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# Distribution of Coal in the US

DISTRIBUTION of bituminous coal and lignite in the US during the third quarter of 1960 is summarized in Mineral Market Report No. 3135, compiled by the Division of Bituminous Coal, Bureau of Mines, US Department of the Interior. Output of coal to geographic divisions and States of destination is analyzed by methods of transportation and types of consumer use. A comparative summary of total distribution, under similar headings, is also made for the first nine months of 1960 and 1959.

The information contained in the report is designed to give a better understanding of the part played by bituminous coal and lignite in the various energy markets of the US. The producing and selling companies covered in the surveys account for about 94 per cent. of all coal produced during the periods under review. In order to account for total industry shipments during the periods, estimates for the remaining 6 per cent. of the total shipments, based on data from coal trade and other reliable coal statistical agencies, are included in the report.

# LIQUIDATION OF COLLIERY COMPANIES

## *Assessing the Results of Settlement*

**No attempt has been made to analyse the position with regard to the settlement of colliery companies following the nationalization of the mines in 1947. Circumstances, however, have made an exercise of this sort possible in regard to colliery companies in Scotland and, says the author, it is probable that the general picture follows broadly the pattern which is disclosed in this article.**

by ALEX. CONNER

NEGOTIATIONS connected with the entitlement payments and liquidation of colliery companies consequent on the Act of nationalization under which the pits came under State ownership have shown that the original estimate of settlement within five years was extremely wide of the mark. Fourteen years after Vesting Day colliery companies are still intimating distribution payments to their shareholders, but the position has now been reached where it is possible to determine beyond any argument whether the terms were fair to the owners and the actual monetary return to the shareholders of the individual companies.

No attempt has been made to analyse the position at company level in respect of the British coalfields as a whole. Circumstances, however, have made an exercise of that sort practical in regard to colliery companies in Scotland and it is probable that the general picture follows the Scottish pattern.

The Scottish District Valuation Board's share of the global sum of £164,000,000 was approximately £23,000,000. In addition, up to the end of June, 1955, by which time only relatively small amounts were outstanding, subsidiary compensation totalled £11,408,000. The total received by Scottish coal-owners from public money in respect of compensation was, therefore, in the region of £34,000,000. It has not been possible to find out the exact amount.

According to the Act, anybody interested could, on request, when the Valuation Boards completed their valuations, have access to the details. But prising the information out of the Ministry of Power is difficult in the extreme.

Even the House of Commons has been refused the information. Mr. L. W. Joynson-Hicks (now Viscount Brentford), in Parliament in December, 1953, said: "It is not the practice to make public the valuations of the individual claimants nor the amount paid to them." Some MPs should have told the then Parliamentary Secretary to the Ministry of Fuel and Power to read the Act.

In 1939, there were approximately 180 colliery concerns in Scotland. It is likely that on Vesting Day the number was in the region of 150. Of these 30 were responsible for something like 90 per cent. of the total Scottish output of 22,500,000 ton.

Colliery compensation allocated to Scottish District Valuation Board came to 14 per cent. of the global sum.

The result of this was that, whereas the take-over worked out in the matter of colliery compensation only at a price equal to approximately £1,000,000 per million tons of annual output in Scotland, the figure was appreciably less in England. In determining entitlements, the Valuation Board had to consider among other things each company's position in relation to profit record over a period of years, its dividend payments, and its real assets in the shape of coal still to work. Pre-nationalization dividend record is of special interest. It shows that, contrary to what was a fairly widespread belief in some circles that mining was a hopelessly inefficient industry, the opposite was the case if profitability is the yardstick. Of the 18 leading companies in Scotland with a Stock Exchange quotation, only three failed to get onto the dividend list during the 10 years prior to the take-over. The average payment in the case of the other 15 ranged from 5 to 20 per cent. with, in a number of cases, capital bonus payments in addition. Table 1 shows the position.

The average of the Summerlee Iron Company for nine years to 1946 was 6½ per cent. The company paid 120 per cent. in 1937, this exceptional payment raising the 10-year average to 18 per cent.

### The Best Possible Price

Individual companies were in full agreement on one point only—their determination to get the best possible price for their business, as they were bound to demand in the interests of their shareholders. Indeed, it was considered quite a help when, after five years with settlement apparently as far away as ever, something like 90 per cent. of the claimants

TABLE 1.—*Average Dividend of Scottish Coal Companies in the 10-year Period Prior to Nationalization.*

| Company. | Dividend (10-year average). |
|---|---|
| | Per cent. |
| Arniston | 8½ |
| Bairds & Dalmellington | 16 |
| Bent | 9 |
| Coltness | 20 |
| Dixon | 9 |
| Dunlop | 5 |
| Edinburgh Collieries | Nil |
| Fife Coal | 16 |
| Lothian | 10 (tax free) |
| | (50 per cent. capital bonus 1939) |
| Manor Powis | Nil |
| Lochgelly | 11 |
| Niddrie & Benhar | 16 |
| | (100 per cent. capital bonus 1940) |
| Nimmo | 7½ |
| Shotts | 5½ |
| Summerlee | 18 |
| United | Nil |
| Wemyss | 10 (tax free) |
| Wilsons & Clyde | 5½ |

decided to accept the Valuation Board's assessment and forgo their right of appeal to an arbiter. The compensation figures are not available in relation to specific categories of assets, but Table 2 gives the total compensation received by the principal companies in Scotland. Alongside the compensation figure is given the amount received by the shareholders (ordinary) and the ordinary paid-up capital at Vesting Date.

TABLE 2.—*Total Compensation Received by the Principal Coal-mining Companies in Scotland.*

| Company. | Total compensation. | Total received by ordinary shareholders. | Paid-up ordinary capital at Vesting Date. |
|---|---|---|---|
| | £ | £ | £ |
| Arniston | 398,201 | 569,293 | 162,500 |
| Bairds & Dalmellington | 3,995,821 | 6,598,341 | 1,631,234 |
| Bent | 95,157 | 239,899 | 182,000 |
| Coltness | 3,741,311* | 6,601,875 | 590,000 |
| Dixon | 854,325 | 1,366,635 | 656,000 |
| Dunlop | 375,513 | 548,318 | 250,000 |
| Edinburgh Colliery | 479,237 | 441,524 | 408,110 |
| Fife Coal | 5,883,973 | 8,178,563 | 1,224,393 |
| Lothian | 3,504,707 | 3,764,528 | 663,000 |
| Manor Powis | 104,427 | Nil | 70,000 |
| Niddrie & Benhar | 1,492,874 | 1,893,333 | 400,000 |
| Nimmo | 749,400 | 1,037,095 | 450,000 |
| Shotts | 742,249† | 1,677,355 | 523,093 |
| Summerlee | 430,668 | 566,343 | 90,000 |
| United | 563,364 | 150,000 | 600,000 |
| Wemyss | 2,105,278 | 2,250,000 | 150,000 |
| Wilsons & Clyde | 626,902 | 1,178,438 | 675,000 |
| *Unquoted:* | | | |
| Alloa | 1,029,304 | 1,509,750 | 366,000 |
| Moore | 306,438 | 538,555 | 30,000 |
| New Cumnock | 637,297 | 685,000 | 31,661 |

* Compensation in respect of Coltness houses to be added.
† Compensation in respect of ancillary assets to be added.

The bulk of the Coltness compensation came from its assets in the Warwickshire and Cumberland coalfields. Where companies had wholly owned or partially owned subsidiaries, *e.g.*, Lochgelly with interests in Forrester, Plean, and Kinneil, and Wilsons & Clyde, with Addie and Darngavil, it may be necessary to read with reserve the output figures where these have been given since they include the subsidiaries. That, however, does not alter the position as regards the amounts

TABLE 3.—*Market Value and Break-up of Ordinary Shares in* 1946.

| | Market value. | | Break-up per 20s., except where otherwise stated. |
|---|---|---|---|
| | High. | Low. | |
| | s. d. | s. d. | s. d. |
| Arniston | — | — | 70 1 |
| Bairds & Dalmellington | 60 6 | 51 10 | 80 10½ |
| Bent | — | — | 13 3 (10s.) |
| Coltness | 68 0 | 41 6 | 167 4 (15s.) |
| Dixon | — | — | 41 8 |
| Dunlop | 19 6 | 15 4 | 43 10 |
| Edinburgh | 3 10½ | 3 7½ | 21 7½ |
| Fife | 76 2 | 48 6 | 133 7 |
| Lothian | 54 9 | 43 0 | 113 6 |
| Lochgelly | 20 9 | 9 6 | 47 7 (8s.) |
| Niddrie & Benhar | 43 4 | 34 0 | 94 6 |
| Nimmo | 17 10½ | 8 3 | 46 1 |
| Shotts | 23 7½ | 15 0 | 64 1 |
| Summerlee | — | — | 125 9 |
| United | 5½ | 1½ | 7½ (2s. 6d.) |
| Wemyss | — | — | 300 0 |
| Wilsons & Clyde | 12 3 | 8 6 | 34 10 |
| Alloa | — | — | 41 3 (10s.) |
| Moore | — | — | 359 0 |
| New Cumnock | — | — | 433 0 |

received by shareholders under the heading total distribution.

Not all the leading producing companies' shares were dealt in on the Stock Exchange, but by far the majority were quoted. Generally speaking, the value which the market puts on a share is regarded as fair. That, at any rate, was the view until the take-over specialists came on the scene and demonstrated that in many instances the market, because of the accounting practice of the day with its obsession for hidden assets, was misreading the situation. But in 1946, the species "take-over" was a rare bird indeed and most shareholders would have felt that a figure in excess of what their shares would have brought on the open market would have been fair and reasonable all round. Table 3 shows how firms fared by that yardstick.

New Cumnock shares were purchased by a trust prior to settlement. The amount paid to the colliery shareholders (ordinary) was roughly equal to the compensation eventually received from Government funds. The figures cover the period from Vesting Date onwards and thus include capital repayments made prior to the commencement of liquidation.

TABLE 4.—*Repayment of Ordinary Capital.*

| Company. | Times repaid. |
|---|---|
| New Cumnock | 21.6 |
| Moore | 17.9 |
| Wemyss | 15.0 |
| Coltness | 11.1 |
| Fife | 6.7 |
| Summerlee | 6.5 |
| Lochgelly | 6.0 |
| Lothian | 5.7 |
| Niddrie & Benhar | 4.7 |
| Alloa | 4.29 |
| Bairds & Dalmellington | 4.0 |
| Arniston | 3.5 |
| Shotts | 3.2 |
| Dunlop | 2.5 |
| Nimmo | 2.3 |
| Dixon | 2.1 |
| Wilsons & Clyde | 1.75 |
| Bent | 1.3 |
| Edinburgh | 1.15 |
| United | 0.25 |
| Manor Powis | Nil |

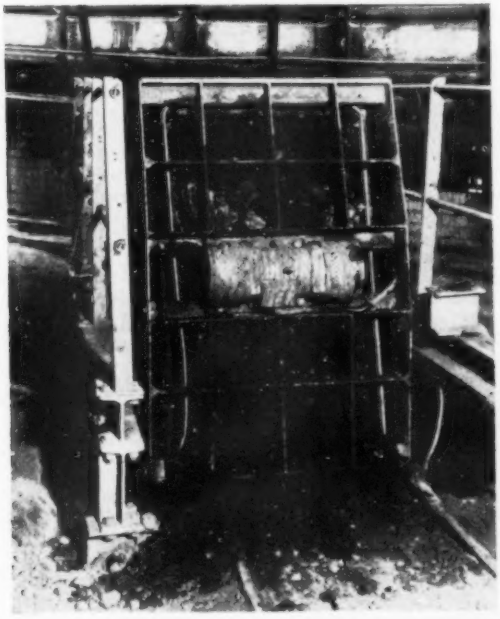
Distributions were made to shareholders in a series of payments extending over the 14-year period up to January, 1961, when the last distribution was announced in respect of Scotland. Some companies made as many as eight distributions (not taxable) in addition to capital return payments. The effect of repaying capital in part was to reduce the unit value of each share in some cases from £1 to 6d. In consequence, to take only two examples, Fife Coal Company's total distribution of £5 14s. 1½d. per 6d. unit seems at first glance much more generous than the Coltness £8 7s. 8d. per 15s. unit, but in actual fact, Coltness paid 11 times and Fife 6.7. Table 4 shows the repayments made to shareholders.

There is, perhaps, one clear lesson which industry generally can learn from the experience of coal as the original guinea pig in the nationalization field.

The possibility of a Labour Government in power may seem remote in the present political climate, but if that should happen there would be further widespread nationalization of key industries and industries on the Labour take-over list would be unwise to discount the threat entirely. All of which emphasizes the folly of unrealistic share values arising in the main from unnecessarily low dividend payments, since dividends to a large extent determine market value. Which prompts the question: "How wrong can the market be?"

# *New Haulage Tub Shake-out*

A NEW haulage tub shake-out using an English Electric vibrator motor has been developed and can be used for discharging coal, stone, clay, cement, lime, and any other bulk material. A haulage tub is loaded into the shake-out which is turned over either automatically or manually, and the complete unit is vibrated for a period ranging from 10 sec. to 1 min. according to the condition of the material being discharged. Soft wet material takes a shorter time than hard cake material. The unit is then returned tot he upright position, allowing the haulage tub to run clear.



ROTATION OF TIPPLER DISCHARGING CONTENTS OF MINE TUB AT RAMSAY COLLIERY, LOTHIANS AREA, SCOTTISH DIVISIONAL COAL BOARD.

This new shake-out can handle tubs up to 1 ton gross weight. Units to handle up to 5-ton mine cars are being developed. Experience has shown that the capital cost can be recovered in as little as two months. For example, there is an average wastage of as much as 20 per cent. in tub capacity and, hence, haulage capacity, because of the amount of material compacted in tubs and incapable of being discharged by normal tippling methods.

With a vibrating shake-out over 95 per cent. discharge can be achieved with a minimum of labour. All tubs are thus in constant use at near 100 per cent payload, haulage costs are substantially reduced, weighing is more accurate, and there are no delays from tub shortage.

The 1½-h.p. vibrating motor is totally enclosed for operation in extremely dirty conditions. The sealed bearings are lubricated for life and no maintenance is thus required. Full-load tests have proved that a life of 20,000 hr. continuous running can be achieved.

Two versions of the shake-out are available; one with a self-contained hydraulic turnover unit and the other with two pneumatic cylinders. Units are built to meet individual requirements. The first units have been installed at Ramsay Colliery in the Lothians Area of the Scottish Divisional Coal Board. They have been developed by Byron & Jones (Engineering), Limited, Hampton Hill (Middx).

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UTAH AUSTRALIA, LIMITED, is to erect the new ferromanganese processing plant at Bell Bay for the Tasmanian Electro-Metallurgical Company, Proprietary, Limited. The plant will handle 140 tons of ore per day, with an anticipated output of 72 tons of ferromanganese per day. This production will eventually be increased by 40 per cent.

# *New Literature*

HOUSE magazines, catalogues, booklets, and other publications received include those mentioned below. Readers wishing to obtain a copy of any of the items referred to are invited to write to the address given, at the same time mentioning IRON AND COAL.

WALLACETOWN ENGINEERING COMPANY, LIMITED, Viewfield Road, Ayr—A new pamphlet gives details of "Wecol" control gear.

BROWN, BOVERI & COMPANY, LIMITED, Baden, Switzerland—Issues of the Brown Boveri Review continue to be out of sequence and the latest available number is for October/November, 1960. The magazine contains many articles covering the company's equipment.

METALECTRIC FURNACES, LIMITED, Cornwall Road, Smethwick 40 (Staffs)—Bulletin No. M.1, "Electric Furnaces for All Industries," is a four-page brochure. The company specializes in the design and manufacture of electric furnaces for melting and all industrial heating and heat-treatment processes.

JAMES BERESFORD & SON, LIMITED, Ace Works, Litts Green, Birmingham 33—This company, a member of the Cornercroft group of companies, has issued a folder containing literature on the wide range of products which it manufactures. Beresford surface-type centrifugal pumps and submersible pumps are available for a variety of purposes. The information contained in the folder is most comprehensive.

ENGLISH ELECTRIC COMPANY, LIMITED, Stafford—Among the many interesting articles in the March issue of the English Electric Journal is "The Theory and Practice of Nitriding," the author of which is Mr. A. Goffey, chief of laboratories of the Liverpool and Netherton works. The process of nitriding was introduced by A. Fry in 1920 and may be defined as a method of case-hardening steel by surface absorption of nitrogen. It is therefore superficially similar to case hardening by absorption of carbon, but, as the author points out, is distinct from this in procedure and is of wider application.

POWER-GAS CORPORATION, LIMITED, P.O. Box 21, Stockton-on-Tees—In accordance with an agreement concluded with Chemiebau, Dr. A. Zieran, G.m.b.H., the company has been responsible for the installation of plants for the production of sulphuric acid which have been completed to the latest Chemiebau designs. Contracts for these and related chemical plant are engineered from initial design data, through procurement and supply, to erection and subsequent operation. Plant designs are based entirely on the specific requirements of the client. A new brochure illustrates the various types of sulphuric acid and related chemical plants which are available through the company.

HUNTINGTON, HEBERLEIN & COMPANY, LIMITED, Simon House, 28-29, Dover Street, London, W.1—In recent years the importance of ironworks' sinter plants has dramatically increased in view of the fact that anything up to 100 per cent. of the blast-furnace burden may nowadays pass through a sinter plant. It is therefore essential that the chemical composition and quality of the sinter should be continuously and accurately controlled, and this demands accurate proportioning of all the ingredients of the sintering mix. An interesting and useful brochure on the subject of the regulation and proportioning of raw materials for sinter plants has been produced by the company, which is a member of the Simon Engineering, Limited, group.

## ELECTRON PROBE MICROANALYZER FOR STEEL

METALLURGISTS at Jones & Laughlin Steel Corporation have developed a new instrument called an electron probe microanalyzer for detailed studies of minute areas of steel and steel products.

It has been installed at the Graham Laboratory, Pittsburgh.

The electron probe microanalyzer is claimed to be an important break-through in the chemical analysis of steels and it makes possible the combined study of microstructure and chemical composition for the development of new products as well as helping quality control.

The new technique is far more selective than even the best microchemical method, since it does not alter the sample or its surrounding structure. For the first time the steel metallurgist can determine the exact composition of a minute segment of steel *in situ* and can detect the changes in chemical composition from one microscopic grain to another which have occurred during solidification, in subsequent processing, and in heat treating.

This study is important, since the small regions in steel rather than the average composition usually dictate the important deviations from standard material behaviour.

The principle involved in electron probe microanalysis is that the high-energy electron beam of the equipment excites X-ray emission from atoms within the region under examination. Each element gives off an identifying X-radiation. By means of crystal analyzers and Geiger counters, the radiation can be measured and amounts of individual elements determined.

It is possible to perform a quantitative anlysis on an area so small that it is scarcely visible in a microscope. The sample must be, of course, contained in a larger mass, but there is, for example, no difficulty in carrying out a whole series of analytical tests on the broken end of a sewing needle.

**Mr. F. J. Erroll, Minister of State, Board of Trade, who is to open this year's Electrical Engineers (ASEE) Exhibition, is a member of the Institution of Electrical Engineers and an associate member of the Institution of Mechanical Engineers. He is the author of a number of technical papers. The exhibition will be opened at Earls Court, London, S.W.5, at noon on Tuesday and will continue until Saturday. Latest developments and new products, estimated at a total value of over £2,000,000, will be exhibited by over 470 firms.**

# ELECTRICAL ENGINEERING ADVANCES

## NEW EQUIPMENT AT LONDON EXHIBITION

SOME of the exhibitors are mentioned below together with brief notes on a selection of the products to be seen at the exhibition.

ENGLISH ELECTRIC COMPANY, LIMITED, London, W.C.2—Ten divisions of the company will be exhibiting. The principal exhibit of the control gear division will be a multi-motor control centre for centralizing the control of any number of motors in an industrial process. As sequence and control wiring and interlocking can be contained within the centre, only power-carrying cables need be run externally. The control units can have rating from fractional to 400 h.p. Supporting this exhibit will be contactless sensing devices such as limit switches, proximity devices, and push-button switches from the Unistat range of static equipment.

These and transistorized logical elements from the Unistat range will be demonstrated with a working model of a mine-car circuit, showing how mine cars can be removed from a cage, emptied, and returned completely automatically. This exhibit has been arranged with the mining division.

The control gear division will also show an a.c. motor speed control unit. The transformer department is showing a model of the new noise enclosure for reducing transformer "hum." Tests have shown that with it the noise level can be reduced by over 22 decibels. The switchgear division will show a model of the "Weatherbeater," a new 33-kV outdoor "packaged" switching station, while the metal industries division is displaying a model of a new sheet-metal classifier, a quality control device for sorting sections of cold strip. The device uses "Datapac" transistorized logical elements.

VICTOR PRODUCTS (WALLSEND), LIMITED, Wallsend-on-Tyne—Examples of the range of weatherproof-and-flameproof and weatherproof-and-vapourproof lighting fittings will be shown. This range is now enhanced by the provision of circulume chokes in certain of these fittings so that mercury-fluorescent lamps may be fitted with no other alterations to the installation.

A new fitting of cast-aluminium alloy construction for two 2-ft. tubular fluorescent lamps, specially designed with shallow dimensions for recessing into reinforced concrete work, will be on show. This fitting may also be suspended in the open air where it is both weatherproof and dustproof.

ASSOCIATED ELECTRICAL INDUSTRIES, LIMITED, Manchester—The largest exhibit on the stand will be one phase of a 275-kV, 15,000-MVA, centre rotating post isolator, incorporating a Type MLGO electro-hydraulic mechanism. This has a normal current rating of 2,000 A and is suitable for carrying 31 kA for 3 sec. An exhibit of special interest from the switchgear division will be the medium-voltage "packaged" substation. This incorporates a 500-kVA, 11,000/433-V, dry-type Class "C" insulated transformer and medium-voltage switchgear. The switchgear comprises a Type AIR air-break withdrawable circuit-breaker, incorporating integral earthing and hinged for easy maintenance, and Type CMC fuse switch units (fitted with h.b.c. cartridge fuse-links of AEI manufacture) to control the outgoing circuits.

On view for the first time will be an addition to the AEI Class "Q" range of switchgear, an 11-kV air-insulated vertically isolated switch unit with integral earthing. This incorporates epoxy resin insulated current and voltage transformers, and has an impulse withstand level of 75 kV. The single-break oil circuit-breaker has bolted type epoxy resin bushings and is designed for ratings up to 250 MVA at 6.6 kV and 350 MVA at 11 kV. Industrial switchgear will be represented by a medium-voltage, 800-amp., Type KC4 unit, with air-insulated busbars.

The main exhibits of the transformer division will be a flameproof dry-type underground mining transformer combined with a flameproof circuit-breaker, a hermetically sealed nitrogen-filled transformer, and a new type 17-position resistor-transition on-load tap changer. The 300-kVA, flameproof, dry-type, class "C" insulated underground mining transformer (Fig. 1) is combined with a flameproof circuit-breaker incorporating internal isolation. There is no fire or explosion hazard with this type of transformer and it can therefore be used at the coal face. This avoids the voltage drop associated with long low-voltage cable runs, and is

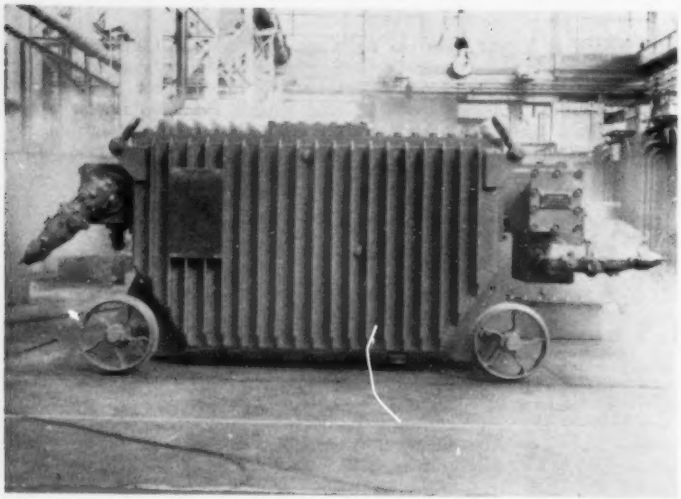

FIG. 1.—AEI 300-kVA CERTIFIED FLAMEPROOF DRY-TYPE CLASS "C" INSULATED UNDERGROUND MINING TRANSFORMER.

of special importance with the increasing use of power at the coal face.

The 750-kVA, dry-type, class "C" insulated hermetically sealed nitrogen-filled transformer has been produced for use under hazardous conditions met in such industries as steelworks, chemical plants, and oil refineries. The weldsealed construction of the tank eliminates all fire risks and prevents the entry of dirt and dangerous gases.

BRUSH ELECTRICAL ENGINEERING COMPANY, LIMITED, Loughborough (Leics)—A wide variety of the products of the various divisions of this company (a member of the Hawker Siddeley group) will be on view. The transformer division will show a 300-kVA dry type, air-cooled flameproof transformer for use below ground in gaseous mines (voltage ratio 3,300/565, three phase, 50 cycles), a 33-kV resistor-type high-speed on-load tap changer suited for a maximum range of 16 steps, 17 positions, and a 500-kVA oil-cooled distribution transformer to specifications BEBS T1 (voltage ratio 11,000/433, three phase, 50 cycles).

Among the products of the switchgear division on view will be a Type HF/OJJ ring main unit as supplied to the Air Ministry. The switch-fuse unit is fitted with 90-amp., 11 kV, LEL fuselinks. In addition to items from the electrical rotating machines and busbar trunking divisions there will be several special and miscellaneous exhibits.

BROOKHIRST IGRANIC, LIMITED, Bedford—This stand will focus attention on "Bi-Stat," the static switching system emphasizing the ease of installation and depicting circuit testing and tracing, the simplicity of logic, and connection diagrams with a saving of both space and maintenance. Various new products will be on show, while there will also be a photographic display of the company's wide range of electrical controls and associated equipment.

CHLORIDE BATTERIES, LIMITED, Swinton, near Manchester—A selection of batteries for a wide variety of applications will be shown by the company. The main feature of the stand will be a working model of an industrial area in the hinterland of a seaport.

ELECTRICAL DEVELOPMENT ASSOCIATION, London, W.C.2—Electrical heating for all types of new and existing buildings will be illustrated on the association's stand. Experienced staff will be available to assist visitors in their inquiries.

EVERSHED & VIGNOLES, LIMITED, London, W.4—The only range of testing instruments which has been designed to meet all the wiring regulations of the Institution of Electrical Engineers for the testing of electrical installations will be exhibited on the company's stand. A selection of the world's largest range of servo motors and motor generators will also be shown.

M. & C. SWITCHGEAR, LIMITED, Kirkintilloch, Glasgow—This company, which has over 70 years' pioneering experience in the design and production of reliable switch and control gear, is displaying a comprehensive range of products with enclosures to suit conditions in all industries. The exhibits include two new designs of particular interest—Unicube starter boards with draw-out starters up to 100 h.p. and a new range of flameproof starters up to 100 h.p. suitable for both individual mounting and board formation.

A Unicube assembly comprises a series of standard cubicle pillars built into board formation. Each pillar, 7 ft. 6 in. high, is of steel construction, divided into self-contained compartments, to accommodate the starters or other apparatus. The number of direct-on starters per pillar relative to horsepower rating is:—Twelve starters up to 7½ h.p.; six starters up to 30 h.p.; four starters up to 100 h.p.; two starters up to 200 h.p. This new design of starter board, provides withdrawable starters up to 100 h.p., interchangeable within their frame size. Cable exits may be provided at the bottom, top, or back of the pillar, and, depending on the arrangement, 7½-h.p. starters can be provided in tiers of 10, 11, or 12 units. Thirty-h.p starters are six tiered and 100-h.p. four tiered, irrespective of cable exits.

A new range of flameproof starters is now available in 10-h.p., 30-h.p., and 100-h.p. ratings. These units are suitable for individual mounting or for assembly in board formation. A maximum of three 10-h.p., two 30-h.p., or one 100-h.p. starter can be mounted either above or below each

busbar unit. This new range incorporates all requirements necessary to meet present-day conditions and embodies the experience gained since the company's first flameproof certificate was granted 38 years ago.

LAURENCE, SCOTT & ELECTROMOTORS, LIMITED, Norwich—An interesting running exhibit will be arranged to compare the performances of alternative industrial precision speed control systems, both capable of high accuracy, stability, and fast response. Two systems may be switched in turn to control the same motor. The systems will be shown applied to a d.c. motor supplied from a Ward-Leonard generator, but may also be applied to the N-S variable-speed a.c. motor. The two systems are the "Velonic," which uses electronic valves (and will be available shortly with semiconductors), and the "Asmag" which uses a magnetic amplifier. Either system is capable of high accuracy, with transient response times for full-load switching of the order of $\frac{1}{2}$ to 2 sec. For long periods the speed may be maintained within 0.25 per cent (of top speed) and within 0.1 per cent. for periods of up to about 30 min. Both the "Velonic" and "Asmag" systems have been applied to a large number of machines in a wide range of industries, and from small powers up to more than 2,000 h.p.

A typical example of centralized draw-out motor control gear will be shown. The latest design incorporates a number of detailed refinements based on operating experience in a variety of industries.

Other exhibits will include a representative range of standard small-power N-S variable-speed a.c. motors. These machines are normally available from stock up to about 20 h.p.

SIEMENS-SCHUCKERT (GREAT BRITAIN), LIMITED, Brentford (Middx)—The company's exhibits are to be divided into two main groups, industrial and flameproof switchgear. Several new ranges of equipment will be shown, including a sheet steel cubicle-type distribution board of double tier design equipped with draw-out type airbreak circuit breakers up to 1,000 amps, one circuit breaker being motor operated. Earth leakage protection of the current balanced type can be provided in each outgoing circuit. Also to be shown is a flameproof distribution board specially designed for the oil, chemical, and gas industries. A range of sheet steel and ironclad automatic contactor starters, direct-to-line, reversing, and star-delta up to 100 h.p. is to be exhibited. The ironclad units can also be built into distribution boards. This range of starters can also be built up in the form of multi-control cubicles of the draw-out pattern. A typical machine-tool control cubicle is to be shown embodying a new wiring system which allows a greater flexibility of design from small wall-mounted to large floor-mounted cubicles. Included among many other exhibits will be a range of sheet steel protection units designed specifically for use with portable equipment.

The company's pioneer work in introducing air-cooled flameproof transformers in coal mines has led to their installation underground in numerous collieries in this country. Two types are to be shown, one in a corrugated cylindrical tank of great strength, housing transformers up to 300 kVA, the other a rectangular tank for transformers up to 150 kVA; the design is such that it can be placed near the coal face along with the gate-end boxes, the space being occupied by little more than two of the latter. The construction is extremely robust for near the coal face, service adaptors being available to enable standard section switches to be lined up directly to the transformer. Special care has been taken to keep the temperature rise to a minimum. This unit will be extremely valuable for use either on the conventional hand-got face, or where plough schemes are envisaged with gate-end boxes at either end of the face. In either case the 3,300-volt supply cable can be brought very near the coal face to obviate the voltage drop associated with oil-cooled transformers, which must be placed at least 300 yd. away.

BRITISH INSULATED CALLENDER'S CABLES, LIMITED, London, W.C.1—The BICC group—the largest cablemaking organization in the world—designs, manufactures, and installs cables, accessories, and complete overhead equipment for railway electrification; for the supply of electricity to cranes, mines, and quarries; for the distribution of high-voltage current generated in large power stations at home and oversea; and for the underwater transmission of electricity by submarine power cable. The group also provides cables for aircraft and ocean-going ships. These various activities will be represented in the BICC display at Earls Court.

PLESSEY COMPANY, LIMITED Ilford (Essex)—Nearly 20 distinct ranges of electrical connectors are being shown by the company. They include the UK-N and UK-C types designed to provide a matched impedance coupling of 50-ohm cables. The UK-N has a screwed coupling and the UK-C a bayonet type. The aluminium Mk. 5 connectors on view are designed to meet conditions encountered between −55 deg. C. and +155 deg. C. ambient temperatures, and the aluminium Mk. 6 types are a new design in miniature multi-pin connectors with high-temperature sealing, crimped connections, and bayonet coupling. Also on show in this section is the brass Mk. 9, a range of heavy-duty connectors suitable for ground connection to guided missiles, and the series 220, a compact type developed primarily for computers.

Rosite, Limited, a member of the Plessey group, is showing a new hot-moulded material. Known as Rosite 3250, it is an addition to the company's range of materials which are supplied as mouldings to the industry. The hot-moulding technique used in the production of Rosite 3250 gives improved dielectric strength, greater dimensional accuracy, and increased resistance to moisture absorption. The heat-resistant qualities are superior to the characteristics normally found in polyester resin-based products.

# New Equipment and Products

## Disposable Industrial Respirators

A PARTICULAR feature of the Sanoid S1181 disposable industrial respirator (Fig. 1) is that every mask is "tailor-made" for the individual wearer. This is accomplished by a flexible top frame which the wearer shapes to his face contours, ensuring a snug, comfortable fitting and preventing access of dust particles between the mask and the face. The mask also fits well under the chin to obviate any infiltration. Another feature is lightness, no special metal holder or other attachment being required. Each is complete in itself and is held in position by two elastic holders, which allow unrestricted movement.

FIG. 1.—SANOID S1181 DISPOSABLE INDUSTRIAL RESPIRATOR.

Faced with black cashmere, the respirator retains a clean appearance throughout its life, and this and its enclosed cotton wool filter pad provide excellent protection yet permit ease of breathing. The mask is muslin lined to give maximum possible comfort to the wearer. With the S1181 there is no time spent on removing used pads and refitting new ones and maximum efficiency is ensured. Furthermore, the cost is reasonable, and when the time saved and the comfort and convenience of the operator are considered, the respirator will be seen to have obvious advantages.

## Corrosion-resisting Flooring Composition

HEAVY traffic and spilled corrosive materials often seriously damage factory floors, necessitating frequent resurfacing. Tretol Epiflor, a new flooring composition developed by Tretol, Limited, Tretol House, The Hyde, London, N.W.9, has been proved under stringent testing to be an ideal material for these floor areas. It is a combination of special resins and aggregate which will adhere strongly to all floors. It gives a coloured, non-slip topping ¼ in. thick, resistant to chemicals, oils and acids, and having exceptional abrasion resistance. It withstands extreme hard wear by foot traffic, trolleys, and trucking, and is easily laid by works maintenance staff.

Tretol Epiflor is especially suitable for use in chemical plants, plating shops, pickling shops, laboratories, and phosphating shops where the floors are attacked by corrosive substances or adversely affected by oils.

## Man Cooler Fans

PRIMARILY designed to provide immediate relief to operators working in close proximity to furnaces, steam-raising plants, and other industrial sources of heat, W. G. Cannon & Sons, Limited, 38a, St. George's Drive, London, S.W.1, has recently introduced a new line of transportable cooling fans which project a well-directed stream of cooling air where it is most required. Because of their mobility they can be quickly positioned in various locations.

These cooler fans are fitted with high-efficiency axial flow-type impellers of cast-aluminium alloy and are powered by amply rated totally enclosed motors

FIG. 2.—CRADLE-MOUNTED MAN COOLER FAN.

to British Standard specification. Aperture diameters of 22 in. and 18 in. are available and both tripod and cradle mounted fans (Fig. 2).

## High-efficiency Magnetic Vibrators

THAT a reversal of the static to fixed weight ratio of electro mangetic vibrators could result in a considerable increase in efficiency has recently been proved by Magco, Limited, Lake Works, Porchester (Hants). In a new design (Fig. 3) the bottom unit, which carries the armature, is comparatively light, while the upper, moving unit, consists of a casting on which is carried the laminations and coil. With an

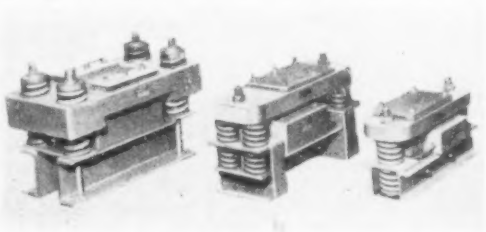

FIG. 3.—THREE ELECTRO-MAGNETIC VIBRATOR UNITS.

original-type vibrator weighing 100 lb., the moving top unit weighed 33 lb. and the bottom unit 66 lb. By reversing the unit, placing the heavier one above, which is equivalent to turning the vibrator upside down, enables it to work with much higher efficiency.

These electro magnetic vibrators have many uses and applications, the most common being where a difficult or damp material will not flow freely from a hopper. Manual hammering will assist, but will not give a reasonably continuous flow. There is a wide range of sizes available including those applicable to bunkers holding hundreds of tons of run-of-mine ore or coal.

In the case of the smaller vibrator units they operate twice per cycle, thus giving 6,000 vibrations per min. on a 50-cycle supply. In the case of the larger models they operate on a half-wave system, giving 3,000 vibrations per min. on a 50-cycle supply. Amplitude at these lower frequencies is much higher thus resulting in a more efficient vibrator. There are, of course, no wearing parts, thus the need for lubrication does not arise. Watertight covers and, in most sizes, flameproof coverings and their associated flameproof control gear can also be supplied.

### New Flow Indicator

SUITABLE for use on pressure lines, where flow is horizontal or vertical, the Model 112 vane-type flow indicator shows the approximate proporation of full flow. If desired, a fractional scale can be incorporated. Observation of the clarity and condition of liquid is possible, and the indicator operates equally well on upward and downward flow. The indicator (Fig. 4) is made and marketed by Suba Hydraulics Limited, Limes Place, Limes Road, West Croydon (Surrey).

Six sizes are obtainable to fit pipes from ¼ in. to 2½ in. dia., the overall dimensions ranging from 4½ in.

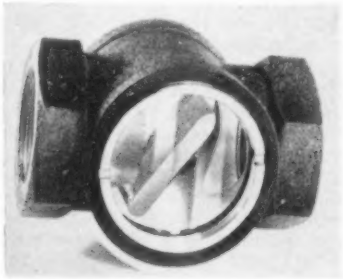

FIG. 4.—MODEL 112 VANE-TYPE FLOW INDICATOR.

long by 1⅜ in. to 6 in. long by 3 in. The unit is constructed of bronze and pressure tested to 100 lb./sq. in. Finish is black wrinkle with chrome rings. The inlet and outlet are threaded BSP. Variations in construction to suit individual requirements can be supplied.

### Stainless Steel Valves

A FEATURE of Audco stainless steel valves, made by the Audley Engineering Company, Limited, Newport (Shropshire), is the polytetrafluorenthylene (PTFE) sleeved plugs employed. Many years of research have gone into the development of this type of valve. Inert and relatively hard PTFE has an extremely low coefficient of friction and is resistant to all chemicals with the exception of fluorine and the molten alkali metals.

The use of this material in a plug valve eliminates risk of falling and sticking caused by metal to metal contact. It results in a valve which is leakproof, requires remarkably low turning effort and is virtually maintenance free.

The valves are made in seven sizes, the largest being 4 in. and the next smaller size 3 in. The main particulars of these two sizes (with the 3 in. in parentheses) are as follow:—Overall length of body, 12 in. (9½ in.); maximum width, 6 in. (5½ in.); approximate weight, 91 lb. (46 lb.); maximum working pressure, 150 lb./sq. in.; body test pressure, 250 lb./sq. in., and seat test pressure, 150 lb./sq. in.

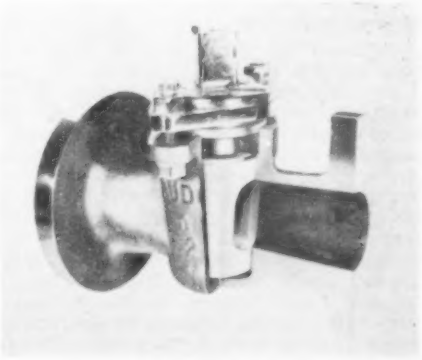

FIG. 5.—SECTIONAL VIEW OF AUDIO STAINLESS STEEL VALVE.

The stainless steel used for the body is 18/10/3 chrome-nickel-molybdenum, and for the cover and gland bolting 18/8 chrome-nickel. A sectional view of the valve is shown in Fig. 5. Audco cast-iron valves up to 3 in. with PTFE sleeved plugs are also made by the firm.

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### Naval Architects' Spring Meeting

Among the papers to be given at the spring meeting of the Royal Institution of Naval Architects will be "Hull Structural Steel—The Unification of the Requirements of Seven Classification Societies" by G. M. Boyd and T. W. Bushell. The meeting will be held in the Weir Lecture Hall at 10, Upper Belgrave Street, London, S.W.1, from March 28 to 30. The institution's summer meeting in Sweden, from September 5 to 8, will include visits to shipyards.

### Promotion of Exports

Advice from five experts for potential exporters is contained in "A Practical Guide to the Promotion of Exports," the second booklet of its kind to be published by the Advertising Association, 1, Bell Yard, London, W.C.2. Guest editor of the booklet, who contributes a foreword warning exporters of the need to tackle the export problem realistically if Britain is not to lose her present standard of living, is Mr. Roger Falk, chairman of Marketing Development Company, Limited, part of the Production-Engineering group of management consultants.

# *Forge Furnace Design*

**Batch-type heating is one of the most thermally inefficient processes in the steel industry. Tests carried out on a modern batch-type furnace suggest basic improvements that might be applied to the design of forge furnaces in general.**

PRELIMINARY study of forge furnace design problems has been made by BISRA Plant Engineering and Energy Division by carrying out tests on a bogie-hearth forge furnace at the works of Walter Somers, Limited. This is an oil-fired furnace, capable of heating ingots up to 65 tons in weight. It incorporates several unusual features, including high-temperature refractories, water-cooled doors and jambs, and a self-propelled bogie.

The performance of the furnace was analyzed in terms of heat balances calculated for hourly intervals throughout the heating cycles, and the results indicate improvements that might be applied in general forge furnace design. A numerical method of evaluating temperature distribution in a heated ingot was verified by measurements taken in the tests; and this should lead to a technique for establishing maximum heating rates for different ingot sizes.

The factors affecting the performance of a batch-type furnace may be conveniently considered under two headings; furnace design and furnace operation.

## Furnace Design

*Size and Shape of Chamber.*—The furnace should be designed to promote high convective heat transfer to the ingot skin during the early stages of heating, while the ingot is receiving little heat by radiation from the furnace walls. In the later stages, when radiation is the major mechanism of heat transfer, provision should be made for even heating by ensuring that all faces of the ingot receive equal radiation.

*Construction Materials.*—Because batch heating involves repeated heating and cooling of the furnace, it is essential that the furnace should have the minimum practicable heat capacity. This can be achieved by using hot-face insulating brickwork. Although the strength of this refractory is much lower than firebrick, it can be successfully used in the construction of bogie-hearth furnaces. However, in fixed-hearth furnaces mechanical damage is more likely. The thickness of the furnace walls should be decided by consideration of heat losses from the structure as compared with the heat stored in the furnace.

*Burner Design.*—High-velocity jet burners are recommended for convective heat transfer, especially during the early stages of heating. Combined gas and oil burners can be used, and will give good convective heat transfer from high-velocity gas flames in the early stages, and radiant heat from highly emissive oil flames in the later stages.

*Waste-heat Recovery.*—To avoid large loss of heat in the waste gas it is necessary to use some form of waste-heat recovery unit. This must have a low heat capacity so that it may efficiently use the variable quantities of waste-heat leaving the furnace chamber. From this point of view, a recuperative system is preferable to a regenerative system.

## Furnace Operation

*Heating Cycles and Soaking Times.*—The thermal efficiency of a furnace is influenced by the heating rates and soaking times employed. Taking into consideration fuel costs, capital costs, and labour costs per ton of throughput, the heating cycle should be kept as short as possible. Numerical analysis of an ingot's internal temperature distribution should lead to a technique for establishing maximum heating rates; and the soaking times needed for close uniformity of temperature can also be accurately estimated. So if the characteristic heat-transfer co-efficient to temperature curve can be found for a furnace, it will be possible to predict the maximum permissible rate of rise of furnace temperature for any particular size and type of ingot being heated.

*Furnace Loading.*—There will be a furnace loading which will produce maximum thermal efficiency. If the furnace is underloaded, a smaller proportion of heat will be taken up by the steel and thermal efficiency will be low. If the ingot is too large for the furnace, so that its head protrudes through a bricked up doorway, heat losses from the chamber will be increased considerably. There is, then, need for careful planning in every forge shop. The furnace sizes should be carefully chosen in relation to the expected range of ingot sizes.

*Furnace Control and Instrumentation.*—Instrumentation can greatly improve the operation of a furnace. Temperature controllers limit the amount of fuel wasted during the heating and soaking periods and prevent damage to the ingot skin by overheating. If necessary, programme controllers may be used to raise the temperature at predetermined rates. To guide the furnace operator, temperatures at various points inside the furnace should be continuously recorded.

The quantity of excess air passing through the chamber affects the waste-gas losses and, consequently, the heating efficiency. A furnace pressure controller will limit the amount of excess air drawn in. This is particularly important where

a large ingot with a protruding head is being heated.

A furnace pressure controller is of little use, however, unless the fuel/air ratio at the burners is also rigidly controlled. This may be accomplished by a mechanical proportioning device at each burner, or the fuel/air ratio to the whole furnace may be accurately set by a proportioning controller.

The thermal efficiency of a forge furnace is influenced by all these different features of furnace design and operation. The British Iron and Steel Research Association is now studying furnace performance, using a pilot scale forge furnace whose characteristics can be radically altered.

# British Iron and Steel Industry Translation Service

FOLLOWING is a list of some new translations available from the Iron and Steel Institute under its translation service scheme. Translations are all classified by numbers, and these should be quoted on applications, which should be addressed to the institute at 4, Grosvenor Gardens, London, S.W.1.

1697: "The Application of the Describing Function Method for Determining the Stability of Sampled Data Control Systems." W. OPPELT. Regelungstechnik, 1960, 8, Jan., 15-18. £2 15s.

1751: "The Burning of Coke." H. SCHENCK, *et al.* Stahl u. Eisen, 1959, 79, Dec., 1933-1938. £4.

1764: "Hydraulic Bloom and Slab Shears." A. HERTL. Tech. Mitt., 1958, 51, Oct., 513-519. £5 5s.

1826: "The Equilibrium of Forces in Rolling with Lateral Spread." I. M. PAVLOV. Stal', 1947 (1), 39-48. £5 15s.

1869: "Applications of Rectifiers to Rolling Mills." M. MATTA. Bulletin AIM, 1959, Apr./May, 323-342. £5 10s.

1913: "The Cranes of the Iron and Steel Works at Rourkela in India." H. RIELÄNDER. Stahl u. Eisen, 1960, 80, May 26, 756-763. £4 15s.

1924: "Hardness Testing of Thin Sheet and Tinned Sheet." E. WONDRIS and V. SEUL. Stahl u. Eisen, 1960, 80, Mar. 17, 356-365. £5 5s.

1929: "Development of Methods of Lining Open-hearth Furnaces in North America." L. HÜTTER. Stahl u. Eisen, 1960, 80, June 9, 788-796. £6.

1945: "The Problem of Weighing Moving Vehicles on a Gradient." W. TÖPFER. ETR Sonderausgabe 11, 1959, Sept., 73-78. £4.

1961: "Improvements in the Photometric Determination of Silicon." Z. KONECNY. Hutn. Listy (Prague), 1959, 14 (10), 903-904. £2 15s.

1963: "Evaluation of Replies to a Questionnaire on the Life of Rolls in Special Steel Rolling Mills." E. WILHELM. Stahl u. Eisen, 1960, 80, Sept. 1, 1207-1211. £3 5s.

1987: "Deformation by Vibration." M. YA. KARNOV and A. A. VORONIN. Kuznechno-Shtampov (Moscow), 1960, 2, Mar., 3-8. £5 5s.

1988: "Cause and Control of Secondary Band Structure in Steel." U. WYSS. Härt-Techn. Mitt., 1960, 15 (1), 14-19. £5 5s.

1989: "Geometry of the Roll Pass in the Hot Pilgering of Tubes." A. P. CHEKMAREV and A. A. CHERNYAVSKII. Izvest.VUZ Chern.Met., 1959, Nov., 47-62. £5 10s.

1990: "The Change in Coercivity During Ageing of Unalloyed Mild Steels." M. NACKEN and W. HELLER. Arch.Eisenhüt., 1960, 31, Mar., 153-160. £4 5s.

2004: "The Design of the Pilger Roll Profile for Achieving Maximum Mill Output." O. A. PLYATSKOVSKII and A. A. CHERNYAVSKII. Izvest.VUZ Chern. Met., 1959 (10), 49-56. £3 5s.

1607: "Value of Tests in a High Magnetic Field, and their Application to the Study of Steels." P. BASTIEN and A. SULMONT. Rev.Mét.Mém.Sci., 1959, 56, July, 131-143. £5 15s.

1857: "Soft-nitrided Gears. Results of Comparative Tests." G. NIEMANN and H. RETTIG. V.D.I.Z., 1960, 102, Feb. 21, 193-202. £7.

1865: "Method of Determining the Toughness of Brittle Materials, Particularly Sintered Carbides." S. PALMQVIST. Jernkont. Ann., 1957, 141 (5), 300-307. £2 15s.

1866: "Improved Method of Supplying Oxygen to the Flame of an Open-hearth Furnace." A. A. DOBROKHOTOV. Metallurg, 1960, 5, Oct., 19-21. £2 15s.

1910: "Determination of Oxides in Steels." P. TORTERAT, *et al.* Rev.Mét.Mém.Sci., 1960, 57, July, 493-499. £4 15s.

1948: "Historical Development and Present State of the Theory of the Piercing Process in Seamless Rolled Tube Manufacture." B. POCTA. Hutnické Listy (Prague), 1959, 14 (10), 844-849. £6 5s.

1954: "Degassing of Ferrous Alloys in Precision Casting.—I." P. DESTABLE. Mét. Constr.Mécan. (Paris), 1960, 92, Mar., 139-153. £5 5s.

1971: "Development of the Metallographic Etching Pattern Taking into Account the Electrolytically Dissolved Quantity of Metal." E. KUNZE and E. HORN. Arch. Eisenhüt., 1959, 30, Oct., 613-619. £3 15s.

1985: "Investigations of the Decomposition Rate of Carbon Monoxide in the Blast Furnace." H. SCHENCK and H. BARTH. Stahl u. Eisen, 1960, 80, Nov. 10, 1681-1689. £4 10s.

1994: "Investigation of the Strength of Seamless and Longitudinally Welded Tubes Under Alternating Torsional Stresses." E. A. CORNELIUS. V.D.I.Z., 1960, 102, June 1, 645-650. £4 15s.

2007: "The Application of a Practical Method for the Measurement of the Diffusion of Hydrogen Through Mild-steel Sheet." P. E. LAGASSE and L. LILET. Rev.Mét.Mém.Sci., 1960, 57, Oct., 729-740. £6 5s.

2018: "The Influence of Nickel on the Impact-resistance of Austenitic Manganese Steel." V. T. BIRYULIN and V. D. SADOVSKII. Trudy Instituta Fiz.Met. (Moscow), 1956 (18), 66-71. £4 5s.

2036: "Operational and Lining Problems with Large Electric Arc Furnaces." O. PORKERT. Stahl u. Eisen, 1960, 80, Nov. 24, 1770-1775. £3 5s.

### FBI's Fuel Efficiency Review

The 1961 edition of "Fuel Economy," an annual review devoted to fuel efficiency published by the Federation of British Industries, 21, Tothill Street, London, S.W.1, contains articles by Sir John Charrington ("The Distribution of Fuel to Industry") and Dr. D. T. A. Townend ("Coal and Science"), and many cogent features on fuel problems, including an analysis of the various methods of disposal of factory waste by E. S. Hobson. The book costs 7s. 6d.

# MECHANIZING THE EXCAVATION of *Cut-off Trenches*

A NEW system of spoil removal in the excavation of cut-off trenches for reservoirs has resulted in an output of 80 cu. yd./manshift, compared with a previous output of rarely more than 1 cu. yd. The orthodox method of excavating cut-off trenches, which may be up to 100 ft. deep and 6 ft. wide, has proved to be both dangerous and expensive. Sometimes more than 100 men have been employed to dig trenches from ground level by hand, using several large jib cranes, with hoppets which have been manually filled and emptied.

A new approach to the problem has been made in recent months by Thyssen Shaft Sinking Company, Limited, on the site of the Staunton Harold Reservoir, near Melbourne (Derbyshire). The excavation of the trench has been undertaken on behalf of Tarmac Civil Engineering, Limited, which is constructing the reservoir for the River Dove Water Board.

### Replacing Manual Labour

The first improvement in the method of excavation was the replacement of manual labour by a Joy-Sullivan N.221 double-drum slusher using a specially designed scraper bucket. The first stage of the operation was to sink a shaft, midway along the site of the trench, to a depth of about 10 ft. in excess of the final trench depth. The plan section of the shaft was 6 ft. (the width of the trench) by 15 ft. The larger dimension allowed for two bays for the positioning of the Joy-Sullivan slusher haulage and a central bay for spoil raising by crane and skips. The shaft was timbered and the slusher scraped spoil into the central bay of the shaft.

Slushing had to be stopped periodically to timber the sides of the trench and to lower the slusher haulage to follow the level of the trench floor. The output of the slushers was, however, restricted by the speed of removal and disposal of the spoil. Thyssen has now overcome this problem after consultation with Michael & Partners, Limited, Chesterfield, and John Smith of Rodley, Limited.

It was decided that the most promising development would be the substitution of a grab for the skips. The grab would have to be a good digger and capable of close guidance to a considerable depth.

Michael & Partners adapted one of its standard 21/17-cu. ft. capacity self-trimming grabs for the purpose. This grab is essentially a digging grab. Owing to the receding radius of its jaws the grab tends to pull itself into the stock so that it digs throughout the closing stroke and lifts a full load every time.

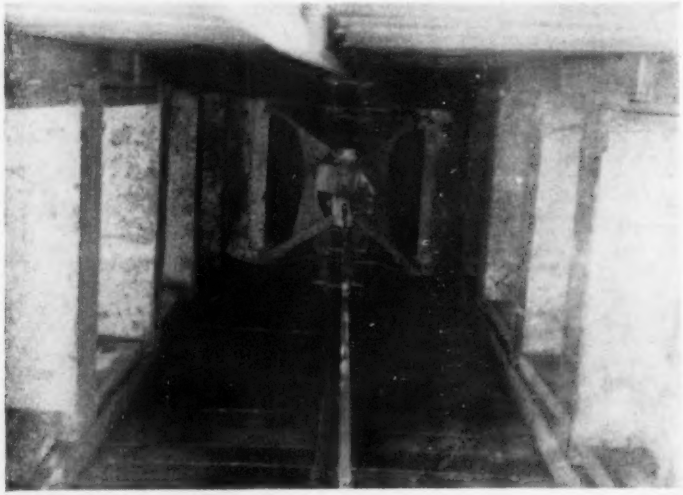

FIG. 1.—SELF-TRIMMING GRAB SLIDING DOWN THE GUIDE RAILS FITTED TO THE TIMBERED SIDES OF THE SINKING BAY. THE SPRING-LOADED GUIDE SHOES ALLOW A LATERAL VARIATION OF 6 IN. BETWEEN THE RAILS.

### Jaws Geared Together

The jaws are geared together with double trunnions to give consistent, smooth closing and are two-rope controlled. They are also bevelled and hard faced so that the grab will cut straight into the ground under its own weight without any added momentum. A spring-loaded guide system (Fig. 1) was designed and incorporated in the grab to give a lateral variation of 6 in. between guide rails. The guide shoes, made in high-carbon steel, have a self-feeding profile.

Using this grab with a standard double-drum Smith 21 excavator, it is now no longer

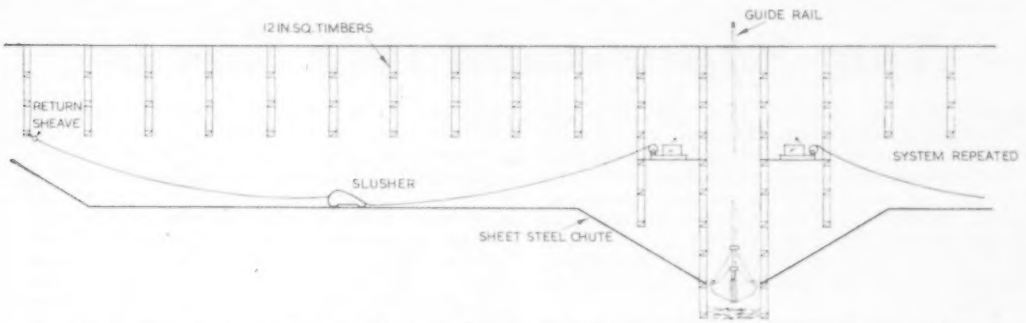


FIG. 2.—SECTION THROUGH CUT-OFF TRENCH, SHOWING THE EQUIPMENT USED FOR THE REVISED METHOD OF OPERATIONS.

necessary to sink a deep shaft at the centre of the proposed excavations.

The method of operation (Fig. 2) starts by excavating a central sinking bay to a sufficient depth to contain a slusher haulage mounted above a sheet steel chute.

With guide rails fitted to the timbered sides of the sinking bay the grab can be dropped straight down to bite into the spoil gathered by the slusher. The combined self-trimming and digging characteristics of the grab enable it to deepen the sinking bay progressively as the trench becomes deeper. These features of the grab result in a perfectly squared off shaft. The speed, drum horsepower, and stability of the Smith 21 excavator are ideally matched to this grabbing operation.

Only 10 per cent. of the excavation is manual. This is devoted to hand-dressing the sides of the trench, timbering and lowering the slusher haulage and sheet steel chute. The labour force has been reduced from 114 men, using eight cranes and eight hoppets, to the two men who operate the crane and the slusher and a third man who controls the grab.

# COAL GAINS PHILATELIC HONOUR

TO commemorate the seventh Commonwealth Mining and Metallurgical Congress, to be held at Kitwe, Northern Rhodesia, the postal authorities of the Federation of Rhodesia and Nyasaland will issue two special stamps on May 8. The sixth congress, at Vancouver, in September, 1957, was likewise marked by a commemorative stamp from the host country—an excellent miniature representation in black and white of a miner drilling an ore face in a timbered gallery.

Many foreign countries have used their postage stamps to publicize various aspects of their mining industries. Mineral extraction activities have likewise been depicted on stamps from many quarters of the Commonwealth, but coal has not so far gained much philatelic honour. Until this year, its only stamp appearance was in Australia, on one of a set marking the 150th anniversary of "the other" Newcastle, which showed coal carrier cranes loading vessels at a busy quayside, a scene equally typical of the mother city on the Tyne, although unlikely to be thus depicted by our own staid GPO, which is now almost alone in retaining the standard sovereign's head style that has been traditional ever since Sir Rowland Hill pioneered adhesive stamps back in 1840.

THIS NIGERIAN STAMP IS PHOTOGRAVURE PRINTED IN VIOLET.

The first Commonwealth stamp specifically devoted to coal mining has just been issued. It is one of the colourful new series on which the independent Federation of Nigeria mirrors its resources and aspirations. Deposits of quite good quality coal are now mined at Enugu, to the extent of about 1,000,000 tons annually, mainly for local use. Nigerian coal mining is under Government management and has developed considerably in recent years.

The stamp, photogravure printed in violet, shows a native miner drilling a coal face. The stamp was printed in London.

**Wire Rope Fatigue Problems**

An international conference on wire rope fatigue will be held in Turin from September 7 to 10 in conjunction with the celebrations of the centenary of the Italian Unity. The conference will be sponsored by the Experimental Laboratory for Building Materials of the Turinese Polytechnic School. The conference programme includes visits to testing laboratories, installations, and firms in the area.

# New Super-weldable Steels

MEETING in Atlantic City, the American Society for Testing Materials was told by Dr. F. C. Hull, advisory metallurgist at the Westinghouse research laboratories in Pittsburgh, of a new "family" of super-weldable stainless steels, described as high temperature, high strength, and highly ductile. Dr. Hull reported on a detailed metallurgical study of the effects of 18 different elements on the hot cracking of chromium-nickel stainless steels.

As a basis for the design of a weldable stainless steel, he stated: "Manganese must be much higher than that normally employed in chromium-nickel steel, and silicon must be low. Higher strengths should be obtained by adding molybdenum or tungsten. If even higher strength is required, the preferred addition is tantalum, not titanium or columbium. The concentration of carbon should be low, although that of nitrogen can be relatively high." The new weldable steels had been developed on these lines and were apparently the first to be designed with weldability as the prime objective, he said.

Already several 1-ton pilot heats of Kromarc steel, as it is named, have been made by the Westinghouse materials manufacturing department in Blairsville, Pa. Forging, casting, welding, and mechanical tests have been run on them. The steels have been applied experimentally to the making of welding rod and the component parts of laboratory vacuum systems. It is predicted that the new steels will soon find their way into larger and more complicated structures which, for design purposes, must be fabricated from stainless steel.

In conducting his research, Dr. Hull evaluated the hot-cracking susceptibility of 1,200 test samples of more than 100 different alloy compositions. The extensive data were made possible through the development of a fast, simple, and inexpensive laboratory technique called the "cast pin tear" test. Using test samples weighing less than an ounce, the technique forecasts hot-cracking susceptibility in steel structures weighing many tons and speeds up its detection thousands of times over slow and expensive conventional test methods.

Hot-cracking can occur during the fabrication by welding of large, thick structures such as the component parts of steam turbines or the high-pressure piping in steam power plants. It also occurs when metals freeze from the molten state as they are made into castings. The basic composition chosen for this study was an austenitic stainless steel containing 16 per cent. chromium and 20 per cent. nickel. The effect on hot-cracking of varying the concentration of these base elements and 16 additional alloying elements then was quantitatively determined.

Dr. Hull reported that the studies show that substantial amounts of manganese decrease the hot-cracking susceptibility of stainless steel and, therefore, increase its weldability. Molybdenum and tungsten, which are effective elements for increasing the strength of steel, also improve its resistance to hot-cracking. Vanadium, another common strengthener of steel, is essentially neutral in its effect. "On the other hand," he said, "two stabilizing elements frequently added to high-strength, high-temperature stainless steels are among the worst in promoting hot-cracking. These elements, titanium and columbium (niobium), are ingedients in steels that have been used for steam power plant applications." An unexpected result of the studies was the discovery that tantalum, which is equally effective in stabilizing steel and improving its strength, does not increase hot-cracking nearly as much as do titanium and columbium.

"Many stainless steels and other high-temperature alloys currently in commercial production contain small amounts of boron or zirconium to increase strength, ductility, and workability. The studies showed that these two elements cause the most extensive cracking of all those upon which quantitative data was obtained. Also, it was found that both silicon and copper have an adverse effect.

# Book Reviews

**Tecnologia Del Acero.** By Jose Maria Lasheras y Esteban. Imprenia Estilo S.A., Zaragoza, 1959. Pages 755 plus 10; appendices 41 pp.; 107 illustrations. 500 pesetas. Obtainable from the author at Primo de Rivera, Huesca, Spain.

THIS book, in Spanish, on the technology of steel is welcome as such books are rare, since so little technical information about the Spanish steel industry has been available since the end of the war. In view of recent developments in Spain and the new industrial outlook there since the country's admission into OEEC and the subsequent liberalization of many imports into that country, particularly in the heavy engineering and machinery fields, this book provides a most useful detailed report on the Spanish steelmaking industry as at the end of 1958.

The book has 49 chapters covering the whole range of steelmaking, from getting the ore to methods of testing the final product. Fairly recent developments are well covered; for instance, there is a chapter on nitriding steels, three grades of which are described, one Al-bearing and two 3 per cent. Cr-bearing, while some account is given of the LD converter process, a plant for which was being installed at the Viscaya blast furnaces at Bilbao.

Full lists are given, in the appendices, of all the

steelmakers in Spain, of the 1958 production by all processes, and of all the grades produced with the applications for which they are being used, including a special schedule of aircraft steels. A most useful comprehensive table is included, in a pocket inside the back cover, giving analyses and physical properties of all steels made in Spain with their trade names for the different makers and their main uses.

Total steel production in Spain was 1,555,120 tons in 1958, compared with 896,795 tons in 1953, but progress has probably been even greater in the last two years. Spain is, indeed, a country in which British industry has been taking greater interest recently, especially for the making of various metal products in that country under licence agreements, and this book should be of great interest to any steelmaker or engineering concern contemplating such developments, once the book has been made more widely available in an English translation.

**Production of Wide Steel Strip.** Iron and Steel Institute, 4, Grosvenor Gardens, London, S.W.1. 65s.

THIS publication is the report of a symposium held in London from May 3 to 5, 1960, and includes a total of 16 papers, together with the relevant discussions. The symposium was divided into five sessions, which covered, respectively:—Future requirements of the tinplate and vehicle industries; steelmaking for wide strip; hot rolling of wide strip; cold rolling and heat treatment of wide strip; coatings on wide strip.

In the foreword, the president of the Iron and Steel Institute, Mr. W. F. Cartwright, draws attention to the fact that the bulk of wide strip produced ultimately finds application in the manufacture of consumer goods, and he relates the future development of the industry to a generally increasing standard of living. This theme is developed in the two papers of Session A covering the future requirements of the tinplate and motor industries. Modern design of motor cars and modern pressing methods have given rise to a demand for wider steel strip and the advantages of coil compared with sheet are mentioned.

Session B, covering steelmaking, begins with a comprehensive review of the present position by R. W. Evans, in which he first of all outlines the requirements of steel quality and then compares the various steelmaking methods which may be used. There follow S. J. Dougherty and R. Duffet's interesting and detailed paper related to open-hearth practice at Great Lakes Steel and Weirton Steel, and the paper by M. Foresi and G. Massobrio describing the work done at Cornigliano on the intensive use of oxygen in the open-hearth furnace.

The last paper in this session is by J. H. Van der Veen, of Ijmuiden, dealing with the practical aspects of quality control, a subject which is all too often overlooked by those concerned more with the technical aspects of steelmaking. The discussion following this session contains a statement by Mr. Jones, of John Summers, on the results obtained at Shotton using the techniques developed at Cornigliano, this probably being the first published reference to these trials. That three of the four papers in this session were directly related to oxygen steelmaking techniques may be considered indicative of growing acceptance of the value of oxygen for bulk steelmaking.

Sessions C and D are concerned with rolling and heat treatment and will doubtless be of most interest to iron and steel engineers. Included is a paper by M. D. Stone on the rolling of very thin tinplate, a subject of increasing interest these days.

The final session deals with the application of coatings on wide strip. The three papers cover tin coatings, galvanizing, and plastic coated steel. This last material seems to have many virtues and the BISRA method of manufacture is described in detail. Some of the difficulties in use are described and it is suggested that the basis of design of many common domestic and industrial articles should be reconsidered to take full advantage of the attractive features of this material. Possible reductions in price are also indicated.

Clearly this is a volume which will find its way mostly into libraries, but it should not be overlooked by students of metallurgy and others wishing to have a clear and up-to-date picture in less than 200 pages of the techniques employed in steel strip production.

**B.H.P. 75 Years.** Broken Hill Proprietary Company, Limited, 500, Bourke Street, Melbourne, Australia. 192 pp.

INCORPORATED in Victoria in 1885 to mine the silver-lead ores of Broken Hill, the Broken Hill Proprietary Company, Limited, has, in three quarters of a century, undergone vast development and change. The mine which gave the company its name has closed, but the company had already made the transition from silver to steel. It is now the heart of the Australian iron and steel industry, an industry which is itself very largely the creation of the company.

How the change came about is told in this large volume published to commemorate the company's 75th anniversary. When it was realized that the days of the silver-lead-zinc mine were numbered the future of the company was found to lie in the iron ore which had been used as a flux in its smelters. The pioneer directors showed considerable foresight and courage, and it is from the steps that they took that the integrated industry of today rose—the largest single producer of iron and steel in the British Commonwealth.

With the years the company has acquired other interests, although all have been related to its basic purposes—the mining and transport of iron ore and coal, the production of iron and steel, and the wise use of their products; or the defence of the nation. The object of this book, then, is to give an account of the achievement and the stewardship of Australia's largest company—owned by 65,000 shareholders—in three quarters of a century of constructive effort in peace and war.

## Automated Continuous Thin-sheet Rolling Mill for USSR

SAID to be the biggest of its kind in Europe, a continuous thin-sheet rolling mill, with a record rolling rate, has been put into operation at the Ilyich iron and steel plant at Zhdanov, in the Ukraine.

The mill is completely automated and mechanized along the whole length of its through-flow line, which is about $\frac{3}{4}$ mile long, the hundreds of units and machines which comprise it being driven by 2,500 motors. For the first time in world practice, the adjustment of the mill is done by means of a self-adjusting system controlled by electronic computers.

CRUDE STEEL OUTPUT in Austria last year is reported to have been at the record level of 3,161,000 tons, representing an increase of 25.8 per cent. over 1959. Pig-iron production, at 2,232,000 tons, was up by 21.5 per cent.

## *Law Cases*

### DAMAGES FOR RTB WORKER

DAMAGES totalling £150, of which £86 were special damages, were awarded to Mr. Emrys James Kenvyn (56), a heater at the Ebbw Vale works of Richard Thomas & Baldwins, Limited, by Judge Rowe Harding at Blackwood (Mon). County Court. Mr. Kenvyn claimed damages from the company for injuries received in an explosion at the company's works in August, 1958.

It was stated that when lighting up the soaking pits after the annual holiday, there was an explosion of gas, causing burns on his face and neck. The company stated that nothing like it had occurred at the works before.

The judge put 80 per cent. responsibility for the accident on the company, and 20 per cent. on Mr. Kenvyn. He said that a valve was left open after the shutdown. Since the accident, the company had laid down a written system for lighting the furnaces after a shutdown.

### STEEL COMPANY'S APPEAL FAILS

AN appeal by the Llanelly Steel Company (1907), Limited, of Llanelly (Carmarthenshire), against a decision of Judge Trevor Morgan at Llanelly County Court on July 19, 1960, awarding £250 damages to an employee, Mr. Frederick Laurence Andrews, for rib injuries suffered in an accident at work in June, 1958, was dismissed with costs by the Court of Appeal.

Mr. Andrews, a crane driver, slipped and fell against the half-open cabin door of a crane as he was about to enter it. The company had denied negligence and breach of duty.

The Master of the Rolls, Lord Evershed, said he was not prepared to differ from the judge's finding that the door being stuck in that position, was out of repair and formed an obstruction, and that Mr. Andrew's injuries flowed directly from his impact with that obstruction.

Lords Justices Upjohn and Pearson agreed.

### CLAIM AGAINST RTB

CLAIM against Richard Thomas & Baldwins, Limited, by Mr. Harry Dennis Wootton (32), for personal damages was dismissed by Judge Norman Carr at Stourbridge County Court. It was stated that Mr. Wootton failed to set the safety catch on a machine at the Brierley Hill factory after he had removed the guard to make an adjustment. A sweeper had hit the foot pedal starting the machine with her broom and the plaintiff had injured his hand.

The judge ruled that there had been no statutory breach of the Factory Act by the firm and no negligence on the part of the sweeper. The accident resulted from negligence by the plaintiff, who was ordered to pay costs.

### £614 DAMAGES FOR LOSS OF KIDNEY

DAMAGES of £614 5s. 8d. were awarded by Mr. Justice Wrangham at Sheffield Assizes to a Jamaican, Mr. Henry McKenzie, a pit haulage hand, who had his right kidney removed after he had been crushed in an accident while working underground at Askern Main Colliery, near Doncaster, in August, 1958. Mr. McKenzie claimed for personal injury against the National Coal Board, who denied negligence and alleged contributory negligence.

The judge found the plaintiff and the Coal Board were equally to blame for the accident.

## Mr. Heath Addresses Cutlers' Feast

DAYS when the Cutlers' Company was the ruling body of Hallamshire were referred to by the Master Cutler, Mr. C. H. T. Williams, chairman and managing director of Park Gate Iron & Steel Company, Limited, at the 325th Cutlers' Feast in Sheffield on Tuesday. Although those days had passed the company still carried great influence, he said.

MR. C. H. T. WILLIAMS

Welcoming the guests, Mr. J. Hugh Neill, past Master Cutler and deputy chairman and joint managing director of James Neill & Company (Sheffield), Limited, said that he could not but comment on "the weight of top brass present from the steel, power, and transport industries." Lord McCorquodale of Newton, president of the British Employers' Confederation, replying for the guests, drew attention to the work of the Industrial Training Council, of which he is a past chairman, and urged all present at the feast to "make sure that, in your own undertakings, the matter of training operatives and the opportunity offered by the 'bulge' is being actively pursued."

The principal speaker of the evening was the Lord Privy Seal, Mr. Edward Heath, who spoke of the wider implications of the division of Europe into two economic blocks by the creation of the Six and the Seven, and of Britain's efforts to bring these blocks closer together. "Our purpose is to reach a fair settlement which can be mutually advantageous to us all, both economically and politically," he said.

## NEW SWEDISH IRON-ORE DEPOSITS

NEW mining area is to be opened up in the Svappavaara area of Sweden. The LKAB board has allocated 5,600,000 kr. for preparatory work during 1961 and production will start when a new railway linking Kiruna to the deposits is completed. During the first year of operation the field is expected to produce 500,000 tons with production rising to 3,000,000 tons in 1967-68. The reserves are estimated at over 300,000,000 tons.

About half of the ore produced will have over 60 per cent. Fe content. The rest will consist of concentrates from low grade ores and is intended to pelletize some of the concentrates. Screening facilities will be available from the start of mining operations, but plants for concentrating and pelletizing will be built later. The mine will be the third largest in Sweden and at full production its exports will be worth about 175,000,000 kr. a year. The additional ores from the new deposits will raise the LKAB production capacity to some 24,000,000 tons, compared with the record 1960 output of 15,700,000 tons.

## *African Notes*

# RECORD YEAR FOR USCO

## Peak Steel Output from Vaal Works

RECORD production figures were achieved during 1960 at the Vaal Works of the Union Steel Corporation (of South Africa), Limited (USCO). Mr. H. R. Curnick, Vaal Works manager, said the open-hearth furnaces reached an output of 137,185 tons against the previous best figure in 1958 of 121,908 tons, and Vaal Works furnaces remained at the head of the Commonwealth open-hearth figures for furnaces of its capacity. The electric furnaces had also increased output to 21,335 tons against the previous best in 1958 of 19,908 tons.

Output from the 22 in. mill increased to 139,939 tons against the previous record in 1958 of 113,132 tons, and the 12 in. and 16 in. mills also created a new record with an output of 32,903 (32,294) tons. The odd sections mill produced 33,787 tons, against the previous best in 1955 of 32,990 tons. The only section not to have made a record was the foundry, which produced 6,485 tons against the previous best in 1957 of 7,714 tons.

During the current year, said Mr. Curnick, it is hoped to get the new 16 in. mill into proper working order, and extensions to the foundry are being considered to bring it up to a capacity of 10,000 tons a year. Other developments envisaged are the changing over of the old gas producer to the new two-stage type; replacement of the old soaking pits to a new soaking pit building; provision of facilities for billet inspection and grinding; and extensions to the 22 in. mill.

### ISCOR Capacity Production

Capacity production is being maintained by the South African Iron & Steel Industrial Corporation, Limited (ISCOR). There have been no further signs of easing in the domestic steel market, and demand has remained steady for most rolled and drawn products, the level being such that no export orders have been accepted, except for neighbouring territories. Distribution of steel products continues on an allocation basis. Iscor recently announced that galvanized corrugated sheets would be sold only in felt packed hand bundles.

Large-scale mechanization of Iscor's iron-ore mine at Thabazimbi, Northern Transvaal, at a cost of about £1,000,000, has increased the rate of production from 30,000 to 35,000 tons a week. Five mining units, each consisting of a gathering arm loader and two diesel-electric shuttle cars are now used in the Eastern section of the mine. Two units are held in reserve. One unit requires only three semi-skilled operators per shift and can produce 1,000 tons of ore a day. The new mechanization is permitting mining in a more restricted area, and two vertical shafts which are nearing completion will be used to transport men and machines to and from various levels in the mine.

Iscor has endowed the University of Pretoria with a Chair of Metallurgy, for which it will provide £5,000 a year for the next 10 years. The chair is in addition to the present faculty of metallurgy and engineering, and Iscor will also provide bursaries.

Cornelia Colliery, the largest coal producer in the Union, reached a new sales record in 1960 by selling more than 4,000,000 tons—a figure claimed to be higher than that achieved by any single colliery in Britain or Europe. About 69 per cent. of the coal sold was used by Escom power stations in the Vereeniging area. In 1912, soon after production started, the amount sold was 296,000 tons. In 1932 it exceeded 1,000,000 tons for the first time, and in 1953, 3,000,000 tons were sold.

Manufacturing industry in the Union has expanded to such an extent that the mining industry is now able to buy 90 per cent. of its requirements locally, according to a recent statement by Mr. C. B. Anderson, president of the Chamber of Mines, Johannesburg. In 1948 the mining industry spent about £39,000,000 on locally manufactured goods and £11,500,000 on imported goods. Last year it bought African goods worth over £127,000,000, and spent only £14,000,000 oversea.

December outputs from 21 South African collieries indicate that coal sales are still running satisfactorily above the depressed levels of a year ago. Of the 21 sales figures, nine show improvements over November, 10 have fallen, and two are steady. Sixteen collieries improved on the December, 1959, figures. Output by the Clydesdale group was 6,000 tons down on November figures, due to a fall of 11,000 tons in output at Coalbrook South. Output in the north section improved again.

Southern Rhodesia has a good chance of building up exports of iron ore and coking coal to Japan worth several millions of pounds a year, according to Mr. Ralph Stanley, chief technical officer of the Southern Rhodesian Department of Mines, who recently visited Japan and Australia on behalf of the Rhodesian mining industry. It was possible, he said, that Southern Rhodesia might export 300,000 to 500,000 tons of iron ore and 2,000,000 tons of coal a year as a start, which would earn an estimated £2,500,000.

Estimated value of mineral production in Northern Rhodesia during November fell to £8,940,806 from the 1959 figure of £10,324,858 for the same month, as a result of the 10 per cent. cut in production agreed upon by the territory's mining companies.

Mineral exports from South Africa during the period January/November, 1960, included the following: Chrome ore, £2,650,171 (£2,569,107); lead ore concentrates, £5,452,292 (£5,686,069); manganese ore, £5,147,945 (£3,286,261); copper, bar and blister, £9,756,810 (£7,793,775); abestos, £11,926,905 (£9,586,602); coal, £1,096,087 (£1,076,297). Mineral exports from East Africa during the period January/August, 1960, included the following: lead ore and concentrates, £885,000; copper and alloys, refined and unrefined, unwrought, £2,689,000.

# *Birmingham Exchange Enters Second Century*

CENTENARY year of the Birmingham Exchange and Engineering Centre has a greater significance than mere longevity. The Exchange will in future be known as the Engineering and Building Centre, Birmingham, and before the year is out it will be installed in its new permanent exhibition hall at the former Masonic Temple in Broad Street, Birmingham.

Speaking at the annual general meeting of the Exchange on Thursday of last week, Mr. A. G. Banks, president, described engineering and building as "separate, but inseparable, twins," and said that a building centre was long overdue in the Midlands. The new centre will have space for nearly 300 engineering and 300 building exhibits.

Last year 62,000 people visited the Exchange to see exhibitions staged by about 260 exhibitors and the information centre handled more inquiries concerned with production capacity than ever before. But the Exchange does not only wait for people to visit it: it takes an active part in organizing facilities at oversea trade exhibitions for its members, and last year the fairs at Leipzig, Poznan, and New York alone resulted in 600 inquiries from foreign buyers.

# Italy to Build Steel Tube Plant

AMERICAN company, Verson All Steel Press Company, of Chicago, is to supply Italy with machinery to manufacture the 240,000 tons of steel pipe with which the USSR is to build its new East to West pipeline. An Italian-Russian agreement was signed last year under which Italy would exchange steel pipes, pipe-line pumping equipment, and synthetic rubber worth $100,000,000 for the equivalent value of Soviet crude oil.

The pipes are to be of the longitudinally welded type with a 46 in. dia. and each 40 ft. long. Since there is no plant in Italy capable of manufacturing them a new plant is to be built by the State-controlled Finsider Steel Holding group at Taranto. The pumping equipment is being supplied by the Nuova Pignone, which is also State controlled. The plant will become the largest in Italy and one of the largest fully integrated steel plants in Europe.

It will have an annual capacity of 2,000,000 tons of steel and will use steel plate from the Siac mill, near Genoa.

## Coke Workers Miss the Bus

UNEMPLOYMENT benefit has been refused to 10 men made redundant by the closure of the Langley Park (Co. Durham), coke works, because they refused to go to Derwenthaugh coking plant where they had accepted alternative employment. Derwenthaugh is some 14 miles from their homes, and the NCB provided a special bus to take employees to the works.

The 10 men objected to the bus route because they had to walk five miles to the embarkation point. Had they been declared redundant when Langley Park closed, they claim, they would have received about £160 each redundancy pay.

*The Scrap Markets*

# Brisk Trade for Cast-Iron Scrap

LIKE steel consumers and stocks of steel, the steelworks are in a similar position, having accumulated stocks of steelmaking scrap in preparation for the winter and possible delays in transport. The provision against the weather was not so necessary as had been thought likely and the situation has been further complicated by the closure of two steel furnaces to balance ingot production between the old and new works of the South Durham Iron & Steel Company, Limited.

The result has been a temporary suspension or limitation in the intake of scrap by several works until existing stocks are reduced to manageable proportions. The demand for cast-iron scrap, however, remains buoyant—so much so that some merchants are having difficulty in getting hold of sufficient material to satisfy customers.

**Cleveland.**—The extra work that has come the way of the foundries is still placing extreme pressure on the available supplies of cast-iron scrap and competition for the machinery and heavier grades is strong. Some merchants report that a scarcity has developed and that material from other parts of the country is difficult to come by.

In spite of the fact that they are carrying large stocks of steelmaking scrap, many of the consuming works are maintaining a steady intake. Blast furnaces are taking up large tonnages of steel turnings and baled scrap and short heavy steel scrap are scarce.

**Scotland.**—The market throughout Glasgow and the West of Scotland shows a slight improvement in the tonnages handled, compared with previous weeks. Part of this is due to longer hours of daylight and improved weather conditions enabling better collections to be made. Although there has been a drop in new orders going to the steelworks there is still sufficient work on hand to keep the demand brisk for all available supplies of heavy steel and basic scrap.

The production of steel turnings is about up to average and consignments are being despatched as they arise to the various consuming works. Output of cast-iron borings remains fairly steady.

Keen competition is now entering into the trade for suitable cast-iron scrap for the foundries; buyers are anxious to secure as much material as possible for prompt delivery and, with supplies being scarce, any lots that do come on the market are quickly disposed of.

# *Lancashire Foundry Trade*

OPERATING conditions at foundries in Lancashire and the north-western region generally are reported to have been maintained at around their recent level, and there has been a corresponding steadiness about the demand for low-phosphorus and most other grades of foundry pig-iron. Deliveries of these from the furnaces are still obtainable with relatively little delay and the majority of users are content to place orders at regular intervals to cover early needs.

A fair aggregate tonnage is being absorbed by the jobbing foundries. These are mostly maintaining full working, though order-books rarely extend far ahead. Easy spots still persist in the light castings trade, though here also a fair movement into consumption is reported.

# IRON AND STEEL TRADE

ORDER-BOOKS present a less " padded-out " look and are becoming related in a much more realistic fashion to current consumption. The pressure under which the rolling mills have been working for the past 12 months is easing off, largely through the diminution in orders for heavy sections, beams, joists, and plate for delivery from mid-May onwards, but there is no sign that there will be any fall in the immediate future in the tonnage of steel required by the heavy engineering and contracting industries.

### Pig-iron

Considerable tonnages of pig-iron are going to the foundries making high-duty castings, not only for the motor-car trade, but also for the machine-tool makers, power and electrical plant manufacturers, and the heavy engineering trade. The low phosphorus grades of pig-iron are in greater demand but adequate supplies are available. Some of the furnaces supplying the low phosphorus irons are, in fact, not working up to maximum outputs.

Large tonnages of hematite are also being taken up by the engineering and speciality foundries, but here again, there is plenty available and, where refined pig-iron is required, there is no difficulty in obtaining prompt deliveries. Producing furnaces for high phosphorus irons have tonnages to spare and oversea outlets are keenly sought.

### Ferro-alloys

The demand for ferro-tungsten is on the quiet side, but most other items are supported at a good level. Ferro-silicon, ferro-chrome, and ferro-manganese are active features, and there is a fair demand for calcium silicide.

A good demand for ferro-niobium, and ferro-titanium is noted and there is a steady call on ferro-vanadium.

### Semi-finished Steel

The heavy call for reinforcing rods and bars is sustained and most of the re-rollers continue to obtain good outputs of small bars and light sections. A large uptake of strip and bright drawn bars is expected as conditions in the motor-car industry improve and there are hopes that similar improvement will be shown in the demand for small bars and light sections.

Mild steel semis are plentiful from home steelworks and most of the re-rollers have good stocks of mild steel billets, blooms, and slabs. The pressure for carbon and alloy steel billets is maintained and is the one section of the trade where difficulties do arise.

### Finished Steel

Many more sizes are appearing on the weekly rolling programmes issued by steelworks as the flow of new business slackens and consumers ask for existing orders to be deferred. The present production of steel plate continues to be maintained, but there is a little dubiety about the strength of future demand in order to keep new plant running at maximum outputs.

The demand for small angles, flats, rounds, etc., has declined slightly with the result that rolling dates for many sizes have been shortened and it is now possible to get early dispatch of galvanized sheet, cold reduced strip, and good commercial quality bright bars.

## Fall in Ore Imports at South Wales Ports

IMPORTS of iron ore through the South Wales ports during the four weeks ended February 26 fell by 66,000 tons compared with the same period last year, although imports of other ores rose by 25,000 tons. Imports of iron and steel goods also rose by 15,000 tons. There was an increase in outward traffic of iron and steel manufactures of 14,000 tons, while exports of tinplate fell by 14,000 tons and those of coal, coke and patent fuel by 4,000 tons.

Total imports and exports at the various ports in the four weeks period, with the figures for the corresponding four weeks in 1960 in parentheses, were Newport, 456,640 (391,561) tons; Cardiff, 364,075 (364,560) tons; Barry, 241,564 (217,893) tons; Port Talbot, 450,265 (501,699) tons; Swansea, 908,513 (1,325,325) tons; Penarth, 55,329 (69,318) tons.

## *British Steelmakers Liked Leipzig*

OFFICIALS of three well-known steel concerns have reported favourably on the value of the Leipzig Spring Fair. It was the first visit of English Steel Export Corporation, Limited, and its managing director, Mr. Geoffrey Craven, said that he hoped it would not be the last, as promising contacts had been made. It was also the first visit for Colvilles, Limited, and the fact that it had been " well worth while " was reported by Mr. J. Pentland.

It was the second year for Firth Cleveland Steel, Limited, and contracts worth about £10,000 with the East German authorities were concluded. Mr. Eric Day, a director, said the company would certainly be exhibiting in 1962.

## PASSING ON OF "KNOW-HOW"

SUGGESTION that specialists in instrument technology should explain their skills to managements of smaller firms with no specialist department to deal with such matters, was made by Mr. P. M. K. Embling, director and general manager of the Power-Gas Corporation, Limited, to the Tees-side section of the Society of Instrument Technology. The UK engineering industry, he said, relied on the instrument makers. It needed simple, reliable equipment which could do the job without a lot of frills.

Much information on instrument making came from the US, but, claimed Mr. Embling, recent events had shown that there might be something to learn from from the USSR.

*Coalfield News*

# Nellie Colliery Wins Safety Diploma

DIPLOMA for the finest safety record of any pit in the West Fife Area of the Scottish Divisional Coal Board has been won by Nellie Colliery. The average number of accidents involving a loss of more than three days work during 1960 was 44.37 per 100,000 manshifts. Blairenbathie Mine was awarded the diploma for the pit showing the best improvement in the accident rates for the year.

The awards were made by Mr. D. J. Skidmore, director of production of the Scottish Division, with Mr. T. D. M. Scrimgeour, general manager of the West Fife Area, presiding. Also present to see Mr. Charles Frew, manager of Nellie Colliery, receive the diploma, was Mr. W. Rowell, former general manager of the Area, who is now general manager of the Alloa Area.

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OLDEST AMBULANCE trophy in Scotland, the Cowan Cup, was won in Glasgow last Saturday by the Coatbridge (Lanarkshire) Mine Rescue Corps.

AFTER 51 YEARS as a miner in South Derbyshire collieries, Mr. George Statham, a deputy at Measham Colliery where he has worked for the last 23 years, has retired.

SECRETARY of the Yorkshire Area of the National Association of Colliery Overmen, Deputies, and Shotfirers, Mr. Laurie Wormald has been nominated for re-election as national president.

OVERALL PRODUCTIVITY in the Durham Division of the NCB again exceeded 23 cwt. during the ninth week of the year at 23.01 (22.31) cwt. per manshift. At the face, OMS was 65.67 (65.57) cwt.

APRIL ISSUE of Mining Review, the NCB newsreel, contains items on the Charrold coal delivery lorry, tiddley winks as a recreation, the place of method study in the coal industry, and the record shaft sinking at Kellingley Colliery.

RETURNING TO work at Rossington Colliery, near Doncaster, on Monday, after the Yorkshire coalfield strike, Mr. Herbert Winter (23), a fitter, was killed in a road accident. Mr. Winter was a member of the Rossington Colliery Band and had passed his final examinations, under the National Coal Board Apprenticeship Scheme, at Doncaster Technical College.

COAL AND COKE SHIPMENTS through the South Wales ports last week showed some recovery and totalled 50,032 tons, compared with 46,945 tons in the corresponding week of 1960. Tonnages shipped from the individual ports (with 1960 tonnages in parentheses) were:—Newport, 9,584 (9,993); Cardiff, 6,865 (5,223); Penarth, 2,037 (2,663); Barry, 12,785 (10,829); Port Talbot, 52 (901); Swansea, 18,709 (17,336).

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OUTLINING the progress made on Sheffield's £9,000,000 development scheme for the railway marshalling yard and freight terminal, Maj. Gen. G. N. Russell, chairman of the Eastern Region of British Railways, told the local division of the British Transport Commission: "We have got to the stage where we are going to have a proper modernization of this conglomeration of railway companies."

# *New Tunnelling Record At Welsh Drift Mine*

FOLLOWING its recent establishment of a new British shaft sinking record, the Thyssen Shaft Sinking Company, Limited, Cynheidre, near Llanelly, has also set up a new tunnelling record for the UK at Blaengwrach New Drift in No. 4 Area of the South-Western Divisional Coal Board. Development work is in progress there, and in a seven-day period between February 20 and February 27 a 14-ft. heading rising at 1 in 300 was advanced 108 yds. through shales, sandy shale, and at times thin coal seams.

The previous record was held by a team of National Coal Board tunnellers at Bank Hall Colliery (Lancs), with an advance of 107 yds. The Thyssen company states that its advance of 108 yds. ended a four-week period in which the drift was advanced 264 yds. in 24 working days at an average of 11 yds. per day.

During the seven-day record period, the ground excavated totalled 1,964 cu. yds., including 50 cu. yds. of overbreak which occurred in the proximity of coal seams. The labour force per shift underground consisted of six face workers, one loco driver, one assistant loco driver and one fitter, and at the surface one lorry driver and two labourers. The efficiency of the faceworkers was 15.44 cu. yds. per manshift, with 7.72 cu. yds. per manshift for all employed. During the seven days, 44 cycles were completed in an average of 3 hrs. 49 min. per cycle, the best achievement being one complete cycle in 2 hrs. 28 min.

Joy Sullivan A.1 47 drilling machines drilled an average of 34 8-ft. holes per round; a round of holes used 83.5 lb. of explosives and gave an average advance of 7.37 ft. For drilling a round of 34 holes, the best time was 25 min., compared with an average of 43 min. The loading of 1,628 trams of muck at 37 trams per round was done by two Atlas Copco L.M. 100 loaders working in tandem in an average of 65 min. per round, with a best effort of 45 min. for the operation. The muck was loaded into 55 cu. ft. Tredomen mine cars, and haulage was by two diesel locomotives.

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# Coal Chartering

MAIN interest in coal chartering from the Hampton Roads area has been on Japanese account and the market is moderately active with rates improving in favour of owners. Recently large April tonnage was fixed to Japan at $8.40 and an 11,000-tonner, for April 15/May 15, fetched the same rate, but charterers conceded $8.50 for 12,500 tons March/April and later $8.60 for a 15,000-tonner to Tokyo Bay, also May shipment. A large 20,000-tonner has been fixed to Japan for July/August at $7.45 and a 24,000-tonner for second half May accepted $7.25. Inquiry is maintained for practically any reasonable loading date. Roads/North Spain has taken a 10,000-tonner for March 17/27 at $4.20, with free discharge, and Hampton Roads/West Italy is reported at $3.95 for an end of March shipment.

There is a fair inquiry from Poland to Eire and 20s. f.i.o. has been paid for March loaders basis Gdynia or Gdansk to Cork or Dublin. A 7,000-tonner for this month's shipment was secured for Cork only at 19s. 6d. Gdynia or Gdansk/two ports Greece paid 30s. 6d. for 9,500 tons, prompt.

# THE COAL TRADE

FROM all areas a brisk trade is reported, particularly for smokeless fuels, and although the sudden onset of the mild spring weather has brought a fairly sharp drop in orders, merchants are kept busy clearing the backlog which had piled up. Few are getting sufficient supplies regularly enough to be able to do much about replenishing stocks and it is generally the case that arrivals are quickly cleared. The situation is steadier in respect of industrial fuels and the prospects seem brighter than a year ago.

### LEICESTERSHIRE

Trade falls still more as the mild weather persists. All grades of house coal are in good supply and tonnages have been coming forward at such strength that some depots have stopped taking supplies. There is a noticeable change in the supplies of anthracite, and wagons of all grades, including beans and grains of the better qualities, have been arriving at most stations and the demand has been satisfied for the time being. Lower grades of anthracite have also been available and distributors are taking the opportunity of building up stocks. French nuts are more plentiful as also are the boiler type sizes, and all Cardiff and Swansea dried cleaned Welsh nuts. All grades of Nottinghamshire and Derbyshire best hand picked coals show a marked improvement and brights and cobbles are also coming forward in quantities of the better types. An improvement is also evident in the supplies of premium smokeless fuels.

The central heating market continues to fall off and there are adequate supplies of all types of coke both by road and rail for all purposes. Those industries having stocks are now clearing them before the end of the season and orders are scarce. There is still some traffic for public utility and service departments, but there is little tonnage passing between distributors and industry generally.

The industrial coal position has eased somewhat, but remains steady for the time of the year. Supplies under programme continue to be available.

## *East Midlands NCB's Stores Holiday Days*

HOLIDAY arrangements for 1961 at the central stores, Coalville, No. 7 Area, East Midlands Divisional Coal Board, have been announced. They are:—

EASTER: Closed from 3 p.m., March 31—7 a.m., April 5. WHITSUN: Closed from 3 p.m., May 19—7 a.m., May 24. ANNUAL HOLIDAY: Closed from 3 p.m., August 4—7 a.m., August 21. CHRISTMAS: Closed from 3 p.m., December 22—7 a.m., December 27.

Similar arrangements, with the exception of Easter, have been made for colliery stores in the Area. Easter dates are:—SOUTH DERBYSHIRE COLLIERIES: (Measham, Donisthorpe, Bretby, Cadley Hill, Church Gresley, Swadlincote, Granville). Closed from 3 p.m., March 30—7 a.m., April 4.

LEICESTERSHIRE COLLIERIES: (Merry Lees, Desford, Mailstone, Bagworth, Ellistown, South Leicester, Snibston, Whitwick, New Lount). Closed from 3 p.m., March 31—7 a.m., April 5.

During the above periods, no deliveries can be accepted at any point, unless special arrangements have been made.

## Rise in Coal Output Follows End of Strike

WITH the return to work at most of the pits engaged in the Yorkshire miners' dispute, saleable output of coal last week rose to 3,742,300 tons, compared with 3,444,300 tons the previous week, the amount of tonnage lost falling from 558,700 to 215,300 tons. There was a further fall in undistributed stocks to 23,884,00 tons, compared with 24,429,000 tons the previous week, and 32,817,000 tons at March 5, 1960.

There were 581,590 wage-earners on colliery books on March 4, against 621,160 on March 5, 1960, the numbers engaged at the coal face being 218,830 and 238,170 respectively. Total absenteeism (all workers) in the week ended March 4 was 16.15 per cent., compared with 15.37 per cent. in the week ended March 5, 1960. Output at the face was 4.023 tons and overall 1.364 tons in the week ended March 4, compared with 3.979 and 1.413 tons in the week ended March 5.

The following table gives (in tons) the revised output of saleable mined coal by division in the week ended March 11, and the tonnage lost through all causes (holidays, disputes, and go-slows):—

| Division. | Week ended March 11, 1961. | | Week ended March 12, 1960. |
|---|---|---|---|
| | Total output. | Tonnage lost. | Total output. |
| Scottish .. | 353,000 | 14,000 | 373,000 |
| Northern (N&C) .. | 244,000 | — | 243,000 |
| Durham .. | 461,000 | — | 478,000 |
| North-Eastern .. | 619,000 | 198,000 | 847,000 |
| North-Western .. | 240,000 | — | 276,000 |
| East Midlands .. | 911,000 | 1,000 | 927,000 |
| West Midlands .. | 281,000 | 1,000 | 296,000 |
| South-Western .. | 384,000 | 1,000 | 413,000 |
| South-Eastern .. | 33,000 | — | 31,000 |
| Great Britain— | | | |
| Deep-mined coal .. | 3,526,000 | 215,000 | 3,884,000 |
| Other deep-mined (including licensed mines) .. | 41,000 | — | 52,000 |
| Open-cast coal .. | 175,000 | — | 169,000 |
| TOTAL .. .. | 3,742,000 | 215,000 | 4,105,000 |

ETERNITE COMPANY, LIMITED, has been formed in Worksop to manufacture and deal in charcoal, activated charcoal, carbon, coke, case hardening compounds, open hearth compounds, and general heavy chemicals. The directors are Mr. John B. Aldred, director of Farnell Carbons, Limited, and Mr. Archibald H. Churchhouse, director of Solvents Reclamation, Limited.

# Japanese Steel Firms Plan £1,400,000,000 Expansion

INVESTMENT programmes amounting to £1,400,000,000, to be completed by 1965, have been announced by six leading Japanese steel companies, the result of which will be to give the leading mills a still greater proportion of the industry's overall capacity, although all companies are investing considerable sums to expand their capacity.

The six companies involved are Yawata, Fuji, Japan Steel & Tube, Sumitomo Metal, Kawasaki Steel, and Kobe Steel, and under the new plan each of these companies is planning to double existing production by 1965. The projects include the construction of 19 new blast furnaces.

Between them, the companies accounted for 66.6 per cent. of Japanese steel production in 1960, but by 1965 they expect to account for 95 per cent. Announcing their plans, the companies said they would concentrate on replacing open-hearth furnaces with converters. This would not only cut the direct production cost of steel, but would also eliminate the necessity for scrap purchases. While trying to improve efficiency in the production of crude steel, the major firms are also expected to branch out into more lines which were formerly made by specialized mills.

Apart from these projects, Yawata and Fuji have also announced the signing of a joint contract with Chile for the importing of iron ore from the Santa Fe region at the rate of 1,000,000 tons a year for 10 years.

## *COI Tells World About British Industry*

REPRESENTATIVES from many branches of the country's industry last week visited the Central Office of Information to see how the Government Information Services are working to increase Britain's prestige in oversea countries, by distributing news about Britain in general and the achievements of industry in particular.

Of especial interest to manufacturing companies is the COI work in arranging tours of industry for officially-sponsored visitors from oversea countries.

Among those who saw the COI at work were: Mr. H. Hall, Arthur Balfour & Company, Limited; Mr. H. S. Stebbing, Barrow Hepburn & Gale, Limited; Mr. Ian McPhail and Mr. R. A. Hill, Dexion, Limited; Mr. V. Brailsford, Alfred Herbert, Limited; Mr. J. C. King and Mr. J. Lock, Imperial Chemical Industries, Limited; Mr. J. D. Woolington, Mappin & Webb, Limited; Mr. E. A. Baldwin, Midland Electrical Manufacturing Company (Taylors Limited); Mr. J. G. Openshaw, Molins Machine Company, Limited; Mr. M. D. Baxter, Simon Engineering, Limited; Mr. J. Read, Standard Telephones & Cables, Limited; Mr. M. L. Millar, Star Aluminium Company, Limited; and Mr. D. C. Peters, Westrex Company, Limited.

FIRE WHICH broke out 1,350 ft. below ground in a pit at Kawara, southern Japan, is believed to have killed at least 72 miners. Rescue teams have recovered 25 bodies and police have abandoned hope of saving the 47 men trapped after the outbreak. In September last year, 67 miners died in southern Japan when another pit was flooded after a cave-in.

## *New International Tin Agreement*

UNDER the new agreement of the International Tin Council, which is to come into effect on July 1, the buffer stock is in theory to contain 12,500 tons of metal, about 2,500 tons more than is at present held. However, provision has been made for the equivalent of 7,500 tons to be held in cash. At its meeting last week the council decided, as expected, that tin exports shall remain free of restriction for the second quarter of the year.

Supplies of tin are currently little more than adequate and it is expected that a recovery in the consumption of the metal both here and in the US is imminent. When export controls were removed in October, 1960, the price of three-months tin was around £800 a ton. The current price is some £10 dearer.

M. Georges Peter, chairman of the council, said after last week's meeting that only three countries had so far ratified the new agreement—Malaya, Australia, and the Congo. Of the latter, Mr. Peter said that exports were still being maintained at a reduced rate, although production was virtually at a standstill.

## Skilled Men Needed to Meet "Export Challenge"

"NO matter how many, or how brilliant, our scientists may be we shall not get the industrial results we require unless we have enough technologists, technicians, craftsmen, and salesmen," Mr. Reginald Maudling, President of the Board of Trade, said last week. He told the Midlands Council of Manufacturers that Britain's output must be expanded more rapidly and consistently if it was to meet the export challenge and that no problem was more urgent than to increase the skill and adaptability of the labour force at every level of industry.

"I do not believe we are doing anything like enough in the training of apprentices, nor do I believe we are making anything like enough use of the facilities available for commercial education," he said. There was no room for any artificial or avoidable restriction on the training of people in new and greater skills.

British industry at its best could meet competition from anyone, but it was not at its best consistently enough. He said that there was a "very encouraging" number of inquiries from firms wishing to increase, or to start, exports, but it would take time for this enthusiasm to show in trade returns.

## *Pakistan Eases Import Restrictions*

AFTER eight years the Government of Pakistan has reintroduced Ordinary General Licensing for commercial goods imported into the country. Among the items now placed on OGL are steel and iron, including tractors and spare parts, spare parts of automotive vehicles, and tyres and tubes.

Under the new policy, parties interested in importing an item placed on OGL will be able to order without waiting for administrative approval. For the present, OGL will be allowed to resident nationals of the country—which means the exclusion of foreign concerns from benefits.

# NEWS IN BRIEF

ACTUAL PRODUCTION of raw steel in the US during the week ended March 13 totalled 1,573,000 net tons compared with 1,580,000 tons in the preceding week.

REPRESENTATIVES of the Japanese firm, Kinoshita & Company, Limited, have been visiting the Dominican Republic to investigate the buying of scrap metal and iron ore.

SPRING MANUFACTURERS of Newburn, Newcastle-on-Tyne, John Spencer & Sons (1928), Limited, is to close down. It began trading 150 years ago and employs 160 people.

TWO FRENCH engineering concerns—Forges et Ateliers du Creusot and Societé Rateau—have joined forces for manufacturing and selling high-powered steam turbines.

FORGED STEEL ROLLS are now being exported by Thos. Firth & John Brown, Limited, to Japan, which becomes the 25th country to which the company exports these products.

DAMAGE estimated at several thousand pounds was caused by a fire which broke out at the Greatham rolling mills of the South Durham Iron & Steel Company, Limited, on Monday.

PLANS for a £A1,000,000 razor blade factory for Gillette Industries, Limited, in Melbourne, Australia, which would produce blades from imported strip Sheffield steel were announced on Tuesday.

MERGER of the Boilermakers' Society and the Blacksmiths' Society will take place on April 6. Negotiations for the merger started after the first world war. The combined membership will be over 105,000.

AS PART OF A long-term expansion programme involving several million Rand, the Aluminium Company of South Africa is to erect the largest aluminium foil rolling mill in Africa within the next year.

ACETYLENE BURNERS were used at the bar warehouse of Firth-Vickers Stainless Steels, Limited, Sheffield, to free Mr. William Storr (40), whose leg was impaled on a steel bar which he had been straightening.

ROTARY compressor casting weighing over 35 cwt. was cast recently at the Taff River foundry of John Williams of Cardiff, Limited. It is claimed to be the largest casting of its type ever made in Europe.

BIRMINGHAM DEPOT of Pritchett & Gold & E.P.S. Company, Limited, battery manufacturers, of London, S.W.1, has been transferred to 234, Stratford Road, Shirley, Solihull, Warwickshire (tel.: Shirley 6661/2).

DURING CASTING operations on Thursday of last week at the Brightside Foundry & Engineering Company, Limited, Sheffield, a mould holding 8 tons of molten metal exploded, killing one man and injuring four others.

ACCORDING TO THE Japanese police, a security official of the Kamikiyo Colliery, Japan, where 71 miners died in a fire on Thursday of last week, has shot himself dead, leaving a note taking responsibility for the disaster.

CONTRACTING DEPARTMENT has been formed by Mather & Platt, Limited, general engineers, of Manchester, under the management of Mr. K. F. King. This means that the company now consists of six trading departments.

OVER 2,000 members of Britain's electrical industry are expected to attend the 13th British Electrical Power Convention, to be held in Eastbourne from June 12-15. The theme will be "Electricity in the Prosperity and Welfare of the Nation."

NEGOTIATIONS are taking place for the export of 2,750,000 tons of iron ore from India. Hungary, Italy, Poland, and East Germany will each take 100,000 tons, Austria 50,000 tons, Japan 2,000,000 tons, and Egypt 300,000 tons.

NEW TOWING CARRIAGE has been installed in the ship model experimental tank belonging to John Brown & Company (Clydebank), Limited. It is of light alloy material and incorporates the most modern ideas in drive, control, and instrumentation.

NORTH STAFFORDSHIRE College of Technology is faced with a space problem because of the increasing numbers of students taking engineering courses. Last year's intake was 540, well above the average, and 90 more are expected in September.

TO CARRY OUT as a principal party, services, works, and operations relating to constructions for Atul Products, Limited, in India, Humphreys & Glasgow (Overseas), Limited, has been registered as a private company with a capital of £5,000.

COAL AND COKE shipments through the port of Garston during February totalled 102,600 tons, made up as follows: Northern Ireland: 77,132 tons (coal and coke); Eire: 19,633 tons (coal); Isle of Man: 3,922 tons (coal); foreign coke: 1,883 tons.

JAPANESE TIN SMELTER with a 12,000 tons yearly potential is being built at Port Swettenham, Malaya. The Japanese concern Ishihara Sangyo Kaisha, which is building the smelter, will own 62.5 per cent. of the shares and the rest of the capital is expected to be raised locally.

ANNUAL CONFERENCE of the work councils of the United Steel Companies, Limited, had Mr. J. E. Pickles, chairman of the works council of the Steel, Peech & Tozer branch of United Steel, in the chair. The conference began on Friday with an address by Sir Walter Benton Jones, chairman of United Steel.

PLANT to manufacture UK and US chemical engineering equipment in Mexico is under construction for Dicon, SA de CV, of Mexico City. Kestner Evaporator & Engineering Company, Limited, S.W.1, has licensed Dicon to make in Mexico some of its chemical engineering products including chemical evaporators, crystallizers, driers, and acid-proof equipment.

NEWTON HOUSE, business premises in Sheffield of Newton Chambers & Company, Limited, which was built 67 years ago, is to be closed in about three months due to redevelopment of the Moorhead area of Sheffield and the widening of Union Street, involving the demolition of the property. The closure will break a direct trading link with the city which has existed for 90 years.

MORE TECHNICIANS were needed by the Western world, Dr. W. Reid, chairman of the Durham Divisional Coal Board, told the North-East branch of the Institution of Plant Engineers at its annual dinner. Russia was producing 10 times as many technicians as Britain, he said, and some of these would be "exported" to China, India, Africa, South America, and other countries.

MANY ASPECTS of the problem of controlling noise will be discussed by 300 industrialists at a three-day conference, starting on June 26 at the National Physical Laboratory. While many of the delegates will come from Britain, there will be a number from Europe and the US. Admission is by personal invitation and anyone interested should write to: The Director, National Physical Laboratory, Teddington (Middx).

*Company News*

# Issue by John Lysaght's Oversea Subsidiary

AUSTRALIAN subsidiary of John Lysaght, Limited, a member of the Guest Keen & Nettlefolds, Limited, group, is to be converted into a public company. An issue of 3,000,000 £A1 ordinary shares in John Lysaght (Australia) Pty., Limited, which makes galvanized iron and steel sheets, is to be made at 40s. a share. All the present issued capital is held by the UK company, whose holding will be 80.7 per cent. after the new issue.

The issue—one of the largest made in Australia for many years—will raise the paid-up capital from £A12,500,000 to £A15,500,000. The board expects to pay dividends of not less than 10 per cent. Earnings for 1960 exceeded 23 per cent. on the capital after the new issue indicating an annual profit of almost £A3,500,000.

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OPPERMAN GEARS (HOLDINGS), LIMITED—All the issued share capital of a newly-formed subsidiary, L.S.A. (Exports), Limited, has been acquired.

FEDERATED FOUNDRIES, LIMITED—Dividend for 1960 is raised to 20 (17½) per cent. and group net profit was £220,033 (£187,059), after tax of £234,940 (£154,014).

DAVIES & METCALFE, LIMITED, manufacturers of mechanical lubricators, etc., of Stockport (Ches)—Final dividend of 11 per cent. makes 16 (15) per cent. for 1960. Net profit was £44,190 (£44,819).

CHARLES WADE & COMPANY, LIMITED, iron and steel stockholders, of Birmingham—Final dividend of 10 per cent. on capital increased by a one-for-two scrip issue, makes the equivalent of 13½ (8½) per cent. for 1960.

CHARLES CLIFFORD, LIMITED, non-ferrous metal manufacturers, of Birmingham—Final dividend of 9 per cent. makes 12 (10) per cent. for 1960. Group net profit was £73,002 (£65,654), after tax of £76,621 (£65,938).

METAL BOX COMPANY, LIMITED—Of the 300,000 £1 ordinary shares offered to directors and employees at 57s. 6d. a share, 3,763 applicants applied for a total of 287,935 shares. The balance of 12,065 shares is not being issued.

ANGLO-SWISS SCREW COMPANY, LIMITED—Final dividend of 7d. makes 10d. per 5s. ordinary share for 1960, on a capital increased by a four-for-five scrip issue, as forecast. Group net profits were £168,272 (£62,046), after tax of £90,977 (£45,388).

TONKS (BIRMINGHAM), LIMITED, brassfounders, etc., of Birmingham—Final dividend is increased by 10 per cent. to 17½ per cent., making 22½ per cent. for 1960, compared with 12½ per cent. Net profit expanded from £44,172 to £68,898, after tax of £59,532 (£38,747).

BRETT'S STAMPING COMPANY, LIMITED—After considering the offer made on behalf of J. & H. B. Jackson, Limited, the directors state that they do not think the offer adequate and cannot recommend holders to accept. The offer was 15s. cash plus six Jackson ordinary 1s. shares for each Brett's £1 ordinary.

NEWTON, CHAMBERS & COMPANY, LIMITED—Group trading profits increased from £1,404,711 to £1,626,003 in 1960, and the dividend is raised 2½ per cent. to 20 per cent. with a 12 per cent. final on a capital increased by a one-for-eight rights issue. The net profit is £618,001 (£558,097) after tax of £528,047 (£509,500).

POLLARD BALL & ROLLER BEARING COMPANY, LIMITED—Final payment of 15 per cent. for 1960 raises the effective total ordinary dividend to 18½ per cent. from the equivalent of 13½ per cent. for 1959 on capital increased by one-for-two scrip and three-for-20 rights issues. Group profits increased to £625,128 (£514,950), after tax of £291,248 (£235,120).

ASSOCIATED ELECTRICAL INDUSTRIES, LIMITED—Orders received during 1960 totalled £223,000,000, compared with £182,000,000, and orders in hand at the end of the year amounted to £181,000,000 (£173,000,000). Group net trading profit was £4,722,439 (£4,746,987), after tax of £3,769,414 (£4,608,073). The dividend is maintained at 3s. per £1 unit with a final of 2s.

COPE ALLMAN & COMPANY, LIMITED, non-ferrous tube manufacturers, of Birmingham—Interim dividend for the year ending March 31, 1961, is maintained at 12½ per cent. on a capital increased by a one-for-three rights issue. A one-for-three scrip issue in "A" ordinary 5s. shares is proposed and a final dividend of 12½ per cent. is forecast on the increased capital.

LAPORTE INDUSTRIES, LIMITED—Offer for the issued share capital of Howards & Son, Limited, has been accepted in respect of more than 90 per cent. of both the ordinary and preference shares of Howards, making the offer unconditional, subject to Stock Exchange quotation for the Laporte shares to be issued, and approval by shareholders of the increase of Laporte authorized share capital.

SHANKS & COMPANY, LIMITED—Chairman, Mr. G. M. Shanks, reports that the total turnover during 1960 well exceeds that of the previous year and prospects for 1961 are not unfavourable. Orders have been coming in steadily and while it is hoped that these will be maintained, there are other important markets from which, owing to the certainty of further import restrictions, the company must expect some decline in demand.

WHARTON CRANE & HOIST COMPANY, LIMITED—Dividend for 1960 is cut from the equivalent of 14⅔ per cent. to 10 per cent. with a final of 5 per cent. Net profit, after tax, was £533 (£37,219). The poorer 1960 results are attributed to the effects of the 1959 recession, keener prices, and the necessity to maintain overhead expenses at a high level to meet the rising volume of orders. The board states that the current order-book is "well filled."

T. F. & J. H. BRAIME (HOLDINGS), LIMITED, specialists in deep drawn press work, of Leeds—Turnover increased by 30 per cent. in the year ended December 31, 1960, and resulted "in a considerable increase in profit," states the chairman, Mr. Ronald H. Braime. Final dividend of 8½ per cent. makes 12½ (10) per cent. for the year. Output is being well maintained and the order-book is "ample" for a considerable period ahead, Mr. Braime says.

ROBERT DEMPSTER & SONS, LIMITED, gas plant and general engineers, of Elland (Yorks)—Offer for the company's share capital has been received from a public industrial holding company. The chairman, Mr. Charles Dempster, and directors have accepted the offer "to safeguard financial difficulties which might be created for the company by death duties in the future," it is stated, and it is expected that the shareholders will also agree. With a backlog of orders, the company has sufficient work on hand to last for the rest of this year.

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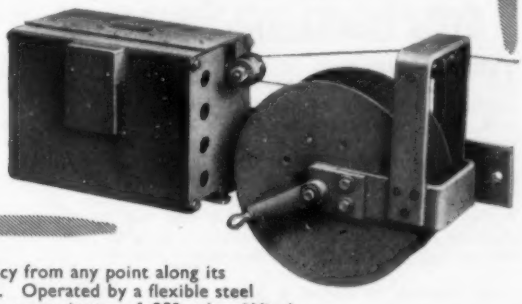
CO-OPERATION of naval architects and the boat-building industry generally is being sought by Fredk. Mountford (Birmingham), Limited, a subsidiary of Guest Keen & Nettlefolds, Limited, to standardize a limited but comprehensive range of sizes for metal fastenings likely to be required in volume throughout the marine industry.

# FACE CONVEYOR SIGNALLING AND MOTOR CONTROL



Enables a conveyor belt to be stopped in an emergency from any point along its length and at the same time gives an audible warning. Operated by a flexible steel pull wire along the length of the conveyor up to a maximum of 250 yds. Winch attached to the control unit and provided with means of attaching to the conveyor head. The GENTS, Fig. 1306, control unit consists of an electrical contact in a certified FLP case, and a mechanically operated 8in. bell. The control unit is fitted with a lockout device so that the unit cannot be restarted after operation until the catch is released, although this does not interfere with the operation of the bell for signalling purposes. Fitted with one P.W.A. gland suitable for B.S.708, type 60 or 61·0048in. but a second P.W.A. gland can be fitted at extra cost.

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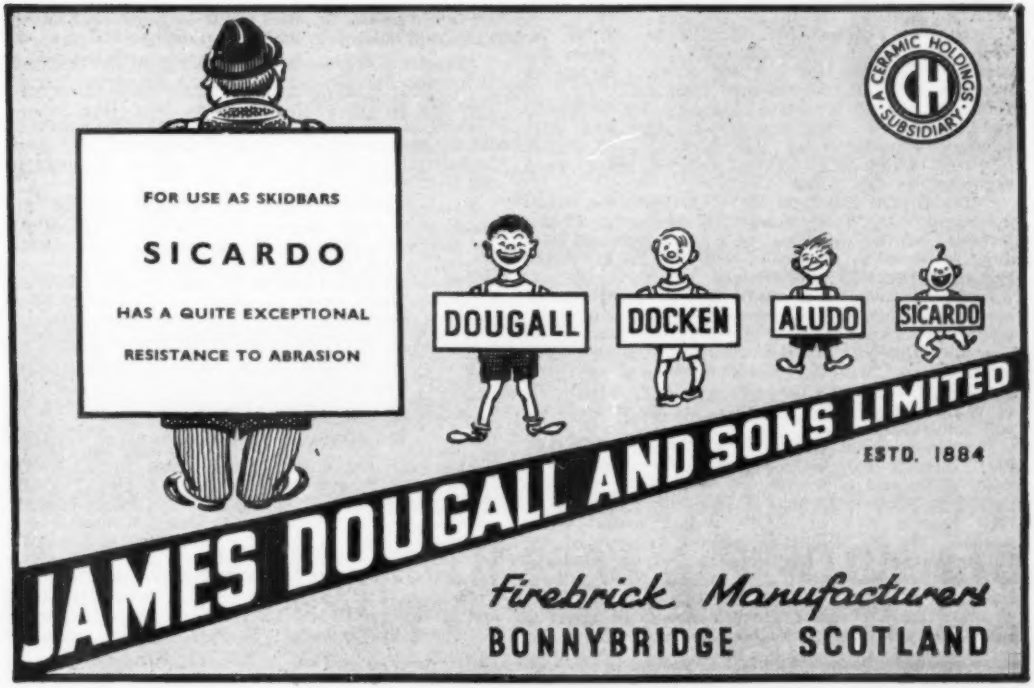

*Board Changes*

# Mr. J. Black Appointed MI's Managing Director

DEPUTY chairman of the METAL INDUSTRIES, LIMITED, group, Mr. John Black has been appointed managing director in addition to his present post. Mr. Wilfred Padley has been appointed deputy managing director.

Mr. Black joined the company as chief accountant in 1951 and was appointed to the board in the following year. He became deputy chairman in 1956. Mr. Padley joined the group in 1956 and was managing director of the subsidiary, Brookhirst Igranic, Limited, before being appointed to the parent board in 1960.

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ALEXANDER STEPHENS & SONS, LIMITED—Mr. J. F. Stephen has been appointed deputy chairman.

LEYLAND MOTORS, LIMITED—Mr. Stanley Markland has been appointed deputy managing director.

LANCASHIRE DYNAMO & CRYPTO, LIMITED—Mr. J. E. Yates has joined the board of this member of the Metal Industries, Limited, group.

FURNESS SHIPBUILDING COMPANY, LIMITED—Rear-Admiral J. H. Unwin has been appointed an executive director of the Haverton Hill-on-Tees shipyard.

STAVELEY INVESTMENT TRUST, LIMITED—Mr. Ian Wright has been appointed chairman in succession to Mr. W. W. Brock, who has retired from the board.

RIO TINTO MINING COMPANY, LIMITED, OF CANADA—Mr. J. N. V. Duncan has been elected chairman of the board in succession to Mr. J. H. Hirshhorn, who retired in January.

MONSANTO CHEMICALS, LIMITED—Mr. D. C. M. Salt has been appointed to the board. He joined the company in 1935 and has been director of sales since 1959.

PERMANITE, LIMITED—Mr. M. C. Cole and Mr. W. Stalley have joined the board. Mr. Stalley joined the company 27 years ago and will continue to act as secretary, a position he has held since 1951.

BRITISH COPPER REFINERS, LIMITED—Mr. J. Varley and Mr. G. H. Parr, refinery manager and sales manager respectively of this subsidiary of British Insulated Callender's Cables, Limited, have been appointed to the board.

CHUBB & SON, LIMITED—Mr. C. A. Larke has joined the board. Mr. W. E. Randall, a director of Chubb & Son's Lock & Safe Company, Limited, becomes sales director of its safe division, and Mr. A. G. Amos has been appointed to the board.

JONES & ATTWOOD, LIMITED—Mr. W. Stringer-Jones is retiring from the chairmanship of the company, which was recently acquired by the Mining Engineering Company, Limited. Mr. Bernard Higgins, joint managing director of MEC becomes chairman and managing director of Jones & Attwood, on which board Mr. G. W. Stanbury, Mr. W. E. Hand, and Mr. P. N. Hood will continue to serve.

PARTRIDGE, JONES & JOHN PATON, LIMITED—Mr. J. F. Pratt, director and production general manager, is to retire at the end of the month. The works, which is owned by Richard Thomas & Baldwins, Limited, will then become part of RTB's Panteg special steels section. Mr. E. Millington, general manager of the Panteg works, will become manager of the company and will join the board.

STEEL COMPANY OF WALES, LIMITED—Former Chancellor of the Exchequer, Viscount Amory of Tiverton has joined the board. A company spokesman said: "The board believes that Lord Amory's knowledge and experience, particularly of European affairs, will be of great value to the company in the competitive conditions developing in all markets of the world. Lord Amory is a director of John Heathcoat & Company, Limited, and a non-executive director of Imperial Chemical Industries, Limited.

CASTROL, LIMITED—On January 1, 1962, four assistant managing directors will be appointed to handle the expansion and further development of the group. They are Mr. J. A. V. Watson, Mr. L. G. Packham, Mr. C. E. R. Millidge, and Mr. A. A. Barr, all of whom are directors of the parent company. The new assistant managing directors will have equal responsibility to the deputy chairman and managing director, Mr. Leonard M. Broadway, and the board. The changes will follow the retirement of Mr. William F. List, assistant managing director since 1951, who will however remain on the Castrol board.

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## *Obituary*

### MR. H. C. WATERSTON

THE death took place on Saturday of Mr. HUGH CRAWFORD WATERSTON, a former vice-chairman of Bairds & Scottish Steel, Limited. He was vice-chairman of Scottish Iron & Steel, Limited, until, in 1939, it merged with the steel interests of William Baird & Company, Limited, to form Bairds & Scottish Steel. He later became a director of William Baird until his retirement last year.

Mr. Waterston, who was 85, was a former chairman of the National Association for Rolled and Re-rolled Steel Products.

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Former general secretary of the Iron and Steel Trades Federation, Mr. JOHN BROWN, has died at the age of 80.

Director of Stourbridge Rolling Mills, Limited, Worcester, Mr. GEOFFREY WORRALL STANDISH died on Saturday at the age of 59.

Head of the mechanical engineering department of Wigan Mining and Technical College from 1919 until he retired in 1943, Mr. SAMUEL HOWARTH MOORHOUSE has died. He was 77.

Former director of Henry Simson, Limited, Sir WILLIAM WALKER died on Monday at the age of 93. He was a well-known authority on municipal electric generation and supply and was the first chairman of the National Joint Industrial Council for the Electrical Supply Industry, being appointed to the Central Electricity Board in 1927.

The death has occurred at the age of 40 of Mr. ROY E. MORWOOD, cost accountant to the English Steel Forge & Engineering Corporation, Limited, Sheffield, and assistant to the chief accountant of the English Steel Corporation, Limited, group's subsidiary companies. He joined the group in 1937.

The death has occurred, at the age of 62, of Mr. RONALD MCDONALD PATERSON, a director of A. R. Brown McFarlane & Company, Limited, iron, steel, metal and scrap merchants, of Glasgow, and Brown & Partners, Limited, engineers and agents, of Glasgow. Mr. Paterson was a past president of the Scottish Scrap Iron, Steel and Metals Association, the National Federation of Scrap, Iron, Steel and Metal Merchants, and the Iron, Steel and Ironmongery Benevolent Association of Scotland.

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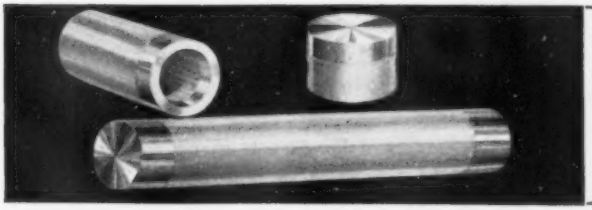

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*In Parliament*

# Engineering Research in Need Of Better Brains

REPLYING to questions on engineering research in the UK, MR. DENZIL FREETH, Parliamentary Secretary for Science, said he was not satisfied with either its volume or quality. There had been an encouraging increase, however, in both teaching and research in engineering in the universities and technical colleges, but the problem would not be solved until the subject attracted the best intellects in the country.

The weakness in the whole problem, he added, was basically the lack of the tradition of research in engineering in many universities and the prejudices against technological education among parents and schoolmasters.

Asked by SIR H. LEGGE-BOURKE (Con.), how the level of civil scientific research in the UK compared with that in other countries, MR. FREETH said a broad comparison was possible only with the United States, which indicated that expenditure on civil research and development might be of the order of 1¼ per cent. of the gross national product of both countries.

In a written reply to MR. JOHN OSBORN (Con.-Lib.), MR. FREETH said national expenditure on research and development rose from £300,000,000, or 1.7 per cent. of gross national product in 1955-56, to £478,000,000 or 2.3 per cent. of gross national product in 1958-59. In the same period, expenditure on civil research and development alone rose from £122,000,000 to £243,000,000. He considered this rate of growth highly satisfactory.

MR. CYRIL BENCE (Lab.), asked what steps were being taken to increase financial assistance for research projects in Scottish universities and research establishments. MR. FREETH said in a written reply that money for research in Scotland had increased in recent years and was now on a considerable scale, but allocation of funds and the siting of scientific establishments had primarily to be determined on scientific grounds.

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### MORE QUESTIONS ON KRUPP ASSETS

LABOUR members again pressed the Government on the question of disposal of the coal and steel holdings of Herr Alfrid Krupp. MR. BRUCE MILLAN said there was extreme dissatisfaction with the lack of progress of the Mixed Committee, and asked MR. EDWARD HEATH, the Lord Privy Seal, to tell the other Governments concerned that the British Government was still serious about the matter and did not intend that the provisions of the Bonn Settlement Convention should be frustrated by continual delays.

MR. HEATH replied that the Government was in touch with other Governments on the subject. It was important, however, to be clear about the purpose of the Mixed Committee, which was only that of deciding whether, because of the circumstances and criteria laid down by the Settlement Convention, an extension for another year should be granted, as was done last time. The Committee might be sitting again for this year, he added.

SIR BARNET JANNER (Lab.), referred to a resolution passed at the annual conference of the Metropolitan area of the British Legion condemning the decision to grant another year's extension, and said it was not merely a question of the sale but of dealing with property which was utilized for the purpose of getting slave labour actively engaged in the interests of the country's enemies. MR. HEATH said he recognized these anxieties existed, but members of the Mixed Committee acted in an independent capacity and did not take instructions from their Governments.

### HOUSING FOR TRANSFERRED MINERS

ASKED by MR. ALBERT ROBERTS (Lab.) about provision of houses for transferred miners, MR. HENRY BROOKE, Minister of Housing and Local Government, said his department was in consultation from time to time on the subject with the Ministry of Power and the National Coal Board.

In the case of Knottingley (Yorks) urban district, he had given approval in principle to the payment of special industrial subsidies in respect of houses to be built for this purpose. If built by the urban district council, they would remain under the control of that authority, he said.

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SPECIAL EFFORTS were being made by the National Lending Library for Science and Technology in making available translations from Russian into English of scientific literature, the Parliamentary Secretary for Science told Mr. Airey Neave (Con.). The European Translation Centre being set up by OEEC would be used by the library for translations from European languages.

ASKED BY Mr. Austen Albu (Lab.), what action was being taken on the proposal by the NATO study group of scientists for an international institute of science and technology, the Parliamentary Secretary for Science replied that the report was awaited of a small working group of scientists set up by the North Atlantic Council to give the proposal the further consideration which the study group recommended.

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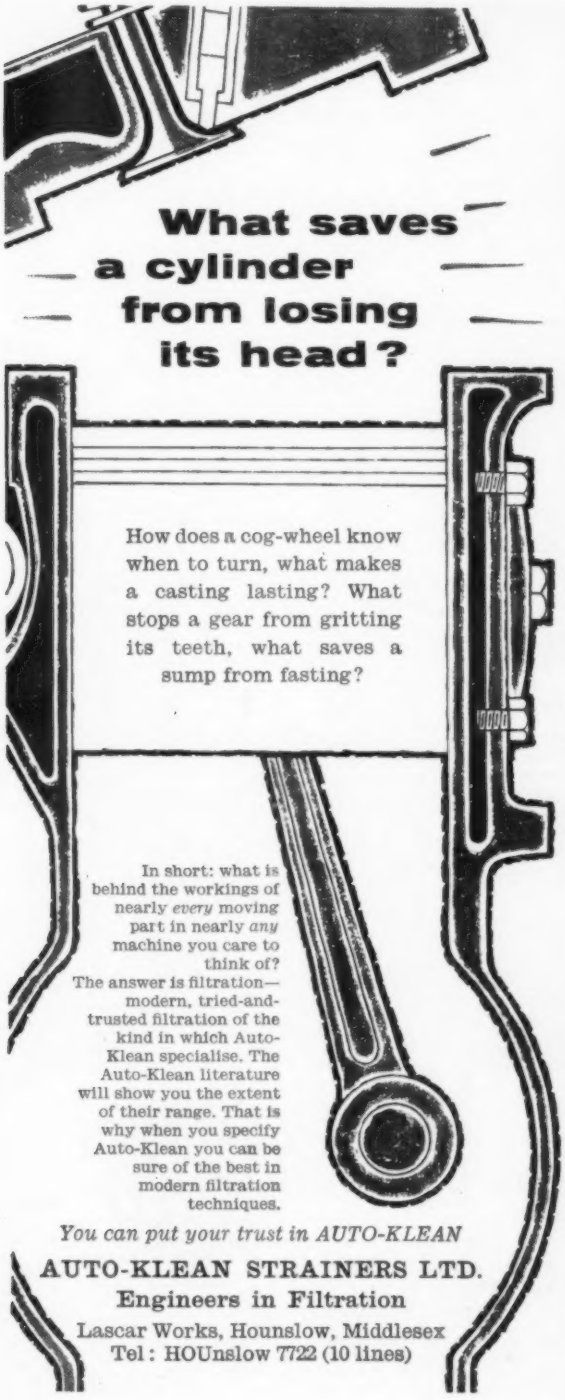
# *Would Methane Imports Aid Coal?*

IMPORTATION of methane into the UK from Algeria may ultimately benefit the coal industry, maintains Sir Henry Jones, chairman of the Gas Council. Negotiations between the council and the French concerns developing the Algerian oilfield for the importation of methane are nearing a conclusion. The council plans to import liquid gas in refrigerated ships with a capacity of about 9,000 tons so that by 1964 methane imports would be in the region of 200,000 tons a year—equivalent to about 450,000 tons of coal.

Under the import agreement methane would be cheaper than coal gas, Sir Henry said. If other costs remain the same the price of gas to the consumer should therefore drop, with a consequent rise in demand. To meet this demand more coal would be needed. He also claimed that methane is suitable for enriching gas produced by the Lurgi process, and that if the production of gas by this method is increased the market for low-grade coals will increase with it.

Speaking at a luncheon on Tuesday, Sir Henry said: "Coal plays an important part in our plans for development and the new gasification plan at Coleshill may foreshadow just as important developments in the use of coal as does the use of imported gas. I certainly do not see the possibility of imported methane as an alternative to the use of coal. I prefer to say 'methane *and* coal,' not 'methane *or* coal'."



# What saves a cylinder from losing its head?

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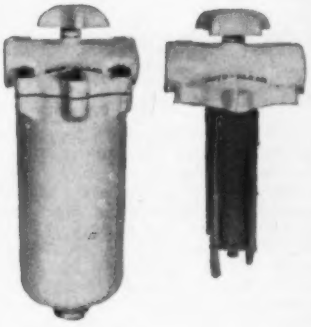
# . . . This self-cleaning AUTO-KLEAN filter



Cleaning is simple—by one complete turn of the handle attached to the element spindle. It is accomplished without interrupting the flow of liquid. Maximum working pressure is 125 p.s.i. Defined meshes range from 0.0015" to 0.010". Maximum flow rate for any conditions—4,000 gallons per hour. Full details will be sent on request.

A range of filters is also available for varying applications and flows up to 150,000 gallons per hour.

# Higher Profits and Production by US Steel Corporation

INCOME of the United States Steel Corporation in 1960 was $304,200,000, or 8.2 per cent. on sales of nearly $3,700,000,000. This compares with income of $254,500,000 or 7 per cent. on sales of $3,600,000,000 in 1959, a year affected by the 116-day steelworkers' strike, says the corporation's annual report. Production of ingots and castings during the year totalled 27,300,000 net tons, which was 99.5 per cent. of the 1957-59 average production, compared with 89.4 per cent. in 1959. Deliveries of steel products in 1960 were 18,700,000 tons, compared with 18,100,000 tons in 1959.

Discussing the progress made through research, the report states that carbon steels, the "bread and butter" of the steel industry, have been improved and developed so that regular grades are now used for many specifications that formerly required alloy steels. New and improved alloy steels had also been developed. Advances had also been made in steel line pipe, which enabled users to transmit 60 per cent. more gas than was possible a decade ago with the same tonnage of pipe.

The report also mentions the new thinner tin plate, commercial production of which was started in 1960 under the trademark of Ferrolite. From 100 lb. of Ferrolite, 1,400 6 oz. cans could be produced compared with about 1,000 made from the same weight of conventional electrolytic tin plate. Steel research, adds the report, had also contributed to improved farming methods, stronger national defence, and significant "breakthroughs" in space exploration.

## *Demand for Sheet Steel Improves*

FULL-TIME working was resumed at the Shotton works of John Summers & Sons, Limited, iron and steel manufacturers, on Sunday. An improvement in the home and oversea demand for sheet steel brought to an end the slightly reduced week which the 10,000 production workers had been working since February 13. The Steel Company of Wales, Limited, whose production workers were put on a shorter week at the end of January, has also reported an improvement in the demand for sheet.

During the period of short-time working John Summers' sheet output was 15 per cent. below the level of last year. A company spokesman said that in contrast with last year, an easing of home demand had made possible an active sales drive abroad. "The results have been highly encouraging," he said. In recent weeks tinplate has also shown some improvement.

## Metal Exchange Opening Postponed

OPENING ceremony of the reconstructed London Metal Exchange has been postponed to April 28. It was to have been opened by the Lord Mayor of London some days earlier, but since he is making an official visit to Amsterdam on April 23, the opening date has been put back so that he can still perform the ceremony.

The arrangements for the dinner to be given by the exchange on April 25 to mark the occasion, remain unchanged.

CROMPTON PARKINSON (CHELMSFORD), LIMITED—Mr. M. P. Foley has joined the board.

# *Recent Wills*

SWALES, JAMES, retired colliery cashier, of Loughborough (Leics) ... ... £12,146

SENIOR, A. A., former engineer at Hartley Bank Colliery, Horbury (Yorks), for 20 years ... ... £5,334

ROSS, B. C., for many years a representative of Robert Sorby & Sons, Limited, tool manufacturers, of Sheffield ... ... £3,353

ADAMS OF ENNERDALE, LORD, former iron-ore miner, and, from 1950 to 1954, a part-time member of the Northern (N&C) Divisional Coal Board ... ... £23,477

LAING, J. C., for many years chief electrician and engineer at Denby Colliery, and later Derby area manager of St. Helens Cable & Rubber Company, Limited ... ... £11,043

PLOWRIGHT, ROBERT, deputy chairman of Plowright Bros., Limited, mining and mechanical equipment manufacturers, of Chesterfield, and a grandson of the founder of the firm ... ... £42,198

SMITH, F. W., chief engineer for 21 years of the Sheepbridge Company, Limited, iron and steel makers, of Chesterfield, and formerly chief engineer at a number of collieries ... ... £30,862

ATHERTON, F. G., leading authority on mining and shaft sinking techniques, former director of Cementation, Limited, and joint managing director of Cementation Contracts, Limited ... £20,035

GEORGE, F. A., managing director of William Dickinson & Company, Limited, iron and steel importers and exporters, of Newcastle-upon-Tyne, and a member of the Tyne Improvement Commission ... £17,524

SIMON OF WYTHENSHAWE, LORD, president (and former governing director) of Simon-Carves, Limited, and president (and former chairman) of Henry Simon (Holdings), Limited, well-known industrialist and worker for social welfare ... ... £397,564

BRUCE-GARDNER, SIR CHARLES, chairman of the British Iron and Steel Corporation, Limited, and of the British Steel Corporation, Limited, deputy chairman of the Steel Company of Wales, Limited, and a director of Consett Iron Company, Limited £419,335

CRAWFORD, JOHN, for many years associated with Stewarts and Lloyds, Limited, general manager of the Islip furnaces and chief fuel buyer for the Corby works until his retirement 14 years ago, chairman of Hydroprest Concrete, Limited, Scunthorpe ... ... £135,329

CROSLAND, BRIG. W. H., chairman of Parson & Crosland, Limited, iron and steel merchants, etc., of London, E.C.2, and of Dyson, Jones & Company, Limited, Middlesbrough iron and steel merchants, and former chairman of the Latin-American committee of the Dollar Export Council ... £103,199

BAUGH, FREDERICK, founder and managing director of Alexander Metal Company, Limited, metal manufacturers, of Bilston (Staffs), director of William Downde, Limited, iron and steel stockholders, of Bilston, and past president of the British Bronze and Brass Ingot Manufacturers' Association ... ... £133,415

SMITH, SIR ERNEST WOODHOUSE, fuel consultant and authority on the gas industry, Director-General of Gas Supply, Ministry of Fuel, 1941-43, former president of the Institute of Fuel, National Smoke Abatement Society, and the Fuel Luncheon Club, and chairman for 10 years of the Industrial Coal Consumers' Council ... ... £147,350

HUMPHREYS, W. O., cokeoven manager for the United Coke & Chemicals Company, Limited, at its Brookhouse coke and by-products plant, Beighton (Yorks), before he retired seven years ago, former chairman of the Midland area group of the Coke Oven Managers' Association, and founder member in 1915 of the Coke Oven Managers' Association in Sheffield ... ... £6,228

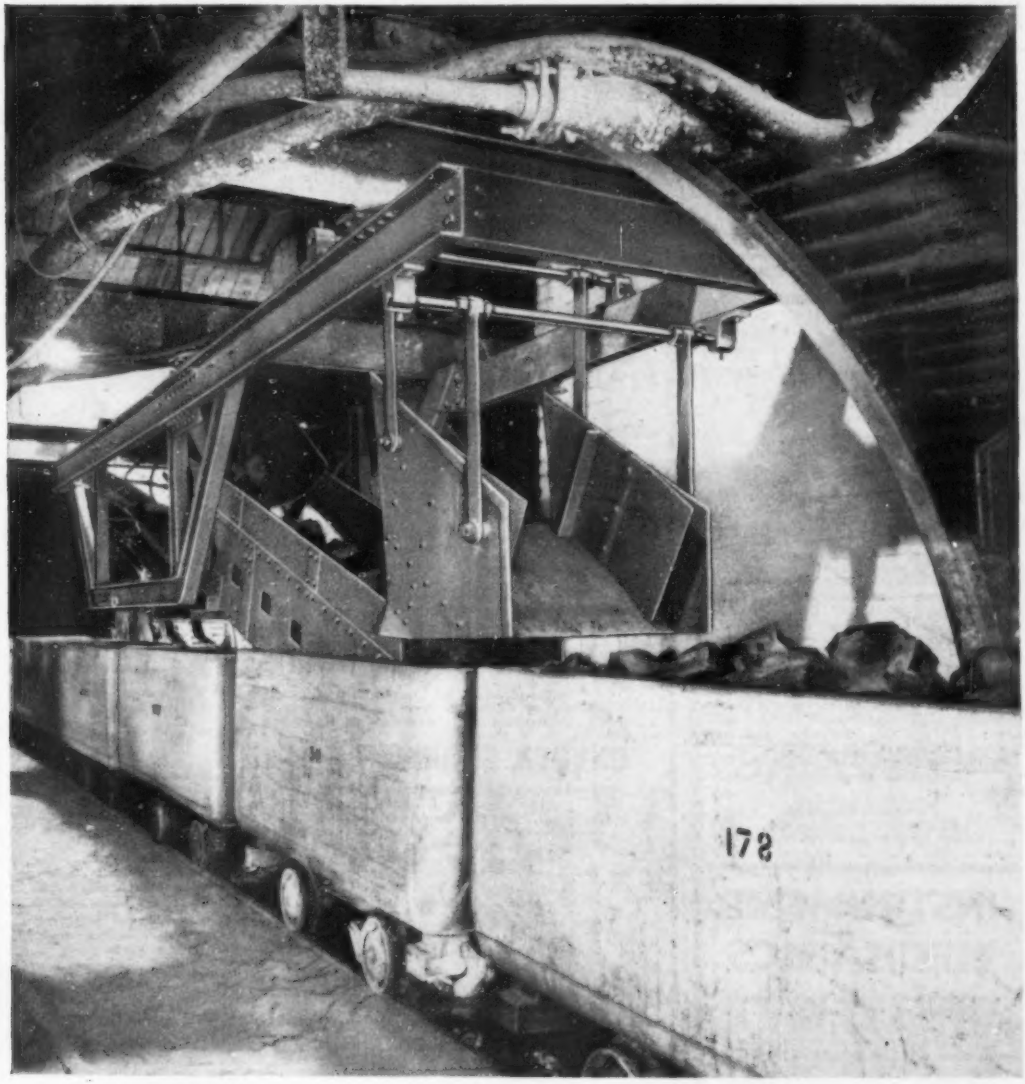
COCHRANE, SIR CECIL ALGERNON, former chairman of Cochrane & Company, Limited, ironfounders, of Middlesbrough, and for many years a leading figure in educational and industrial life in the North of England; also a former director of Rolsover Colliery Company, Limited, Blackwell Colliery Company, Limited, and Consett Iron Company, Limited; Liberal MP for South Shields from 1916-1918 ... ... £410,666

INTESTATE

FULLER, JOHN HENRY, industrial relations officer for No. 2 (Doncaster) Area of the North Eastern Divisional Coal Board ... ... £2,844

SWALLOW, R. H., of Pilsley, near Chesterfield (Derbyshire), former manager of Morton Colliery, East Midlands Divisional Coal Board ... ... £5,646

PRIESTWOOD, T. M., former Manchester representative of the West Midlands Divisional Coal Board, and for many years colliery sales manager for Settle, Speakman & Company, Limited ... ... £4,349

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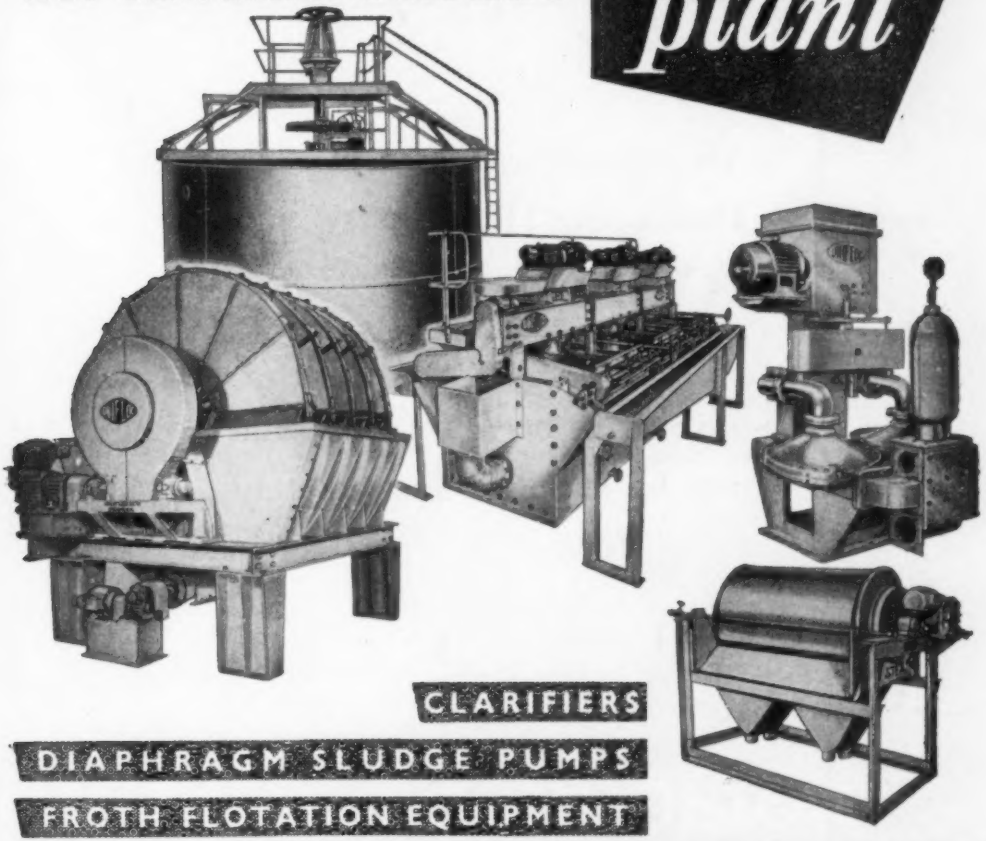

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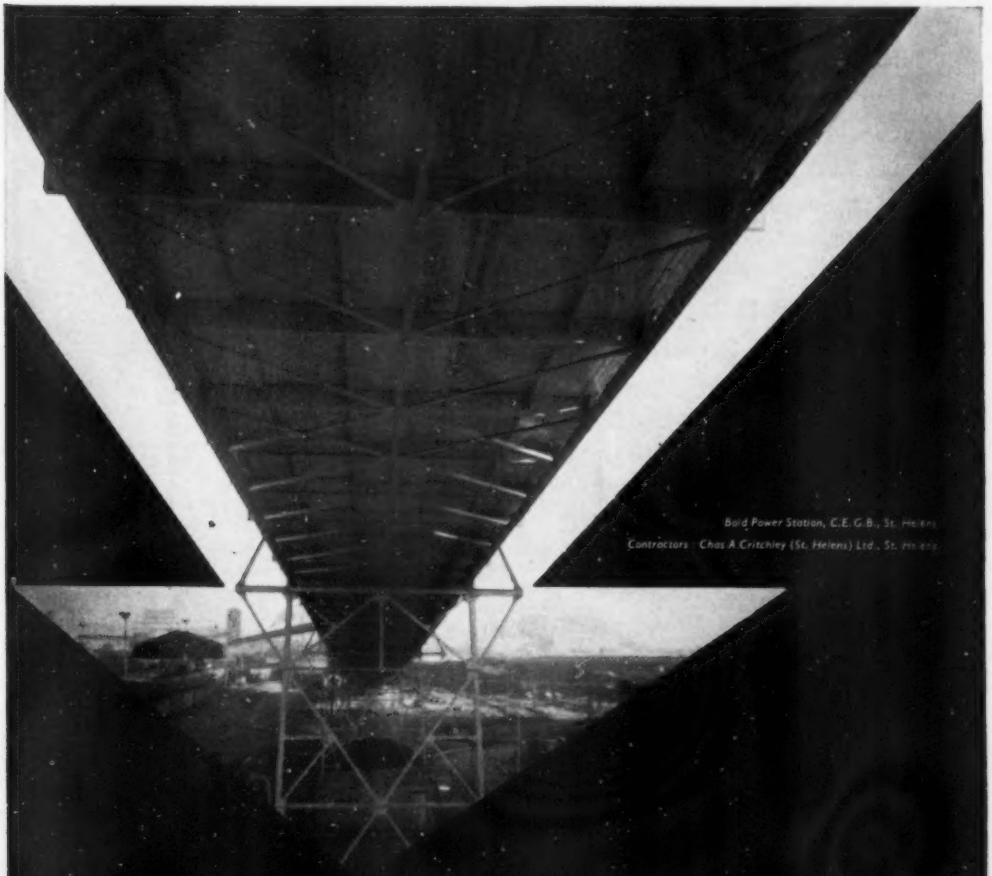


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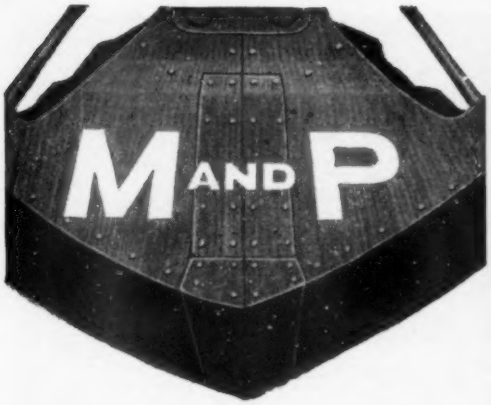


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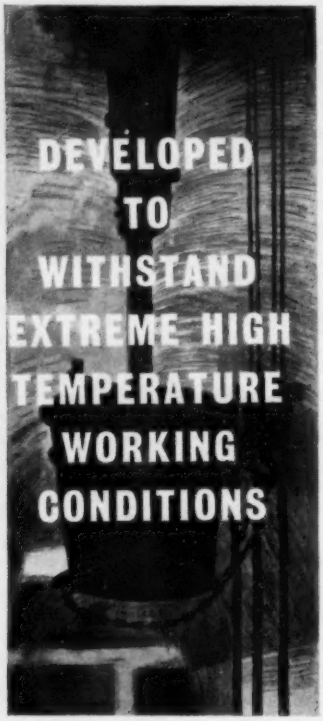


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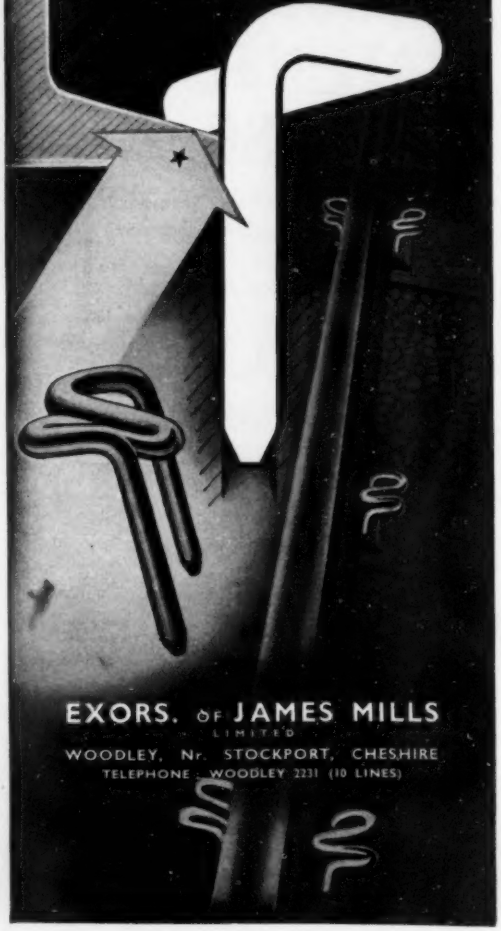

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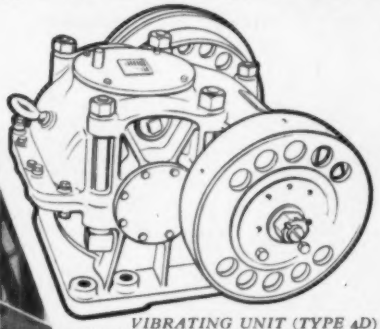

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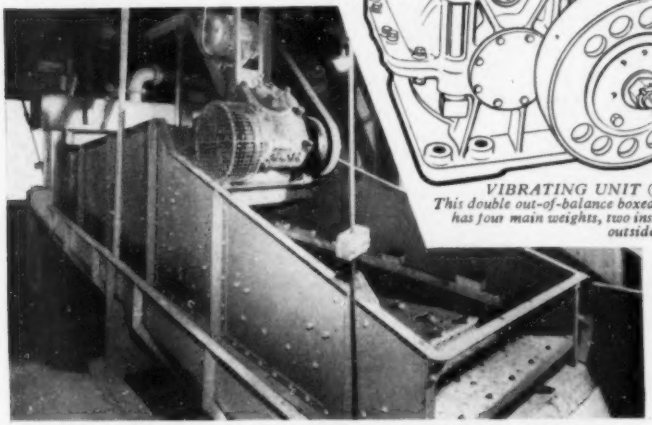

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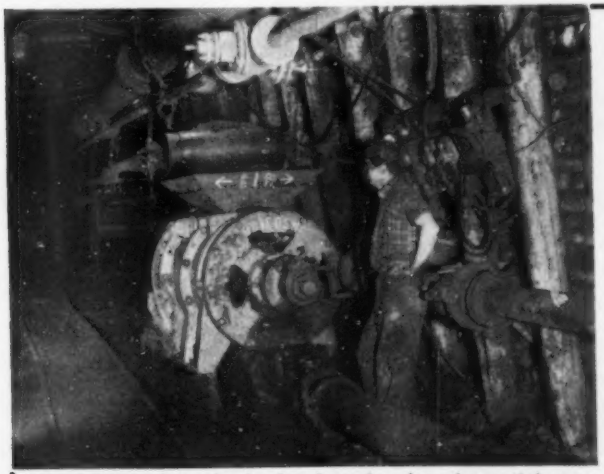

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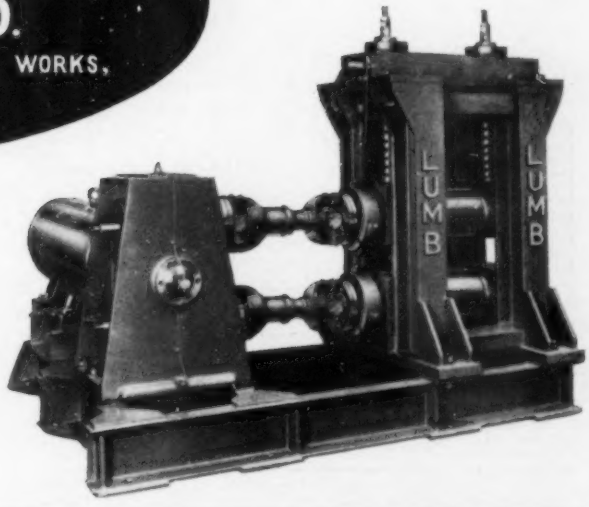


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Hanmade Conveyor Co. Ld. .. —
Hardman, E. Son & Co. Ld. —
Harland Engineering Co. Ld. 59
Harlow, Robt. & Son Ld. .. —
Harvey, G. A. & Co. (Ldn.) Ld. 17
Hatchett & Co. Ld. .. .. —
Hayden-Nilos Ld. .. .. —
Head, Wrightson & Co. Ld. —
Head, Wrightson Minerals Engineering Ld. .. .. —
Head, Wrightson Machine Co. Ld. .. .. .. .. —
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Heap, Joshua & Co. Ld. .. —
Heeley (Mining Machinery) Co. Ld. .. .. .. —
Hick, Hargreaves & Co. Ld. —
Hill, Richard Ld. .. .. 30
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Hudswell, Clarke & Co. Ld. .. —
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Hunslet Engine Co. Ld. .. —
Huntington, Heberlein & Co. Ld. .. .. .. .. —

Imperial Chemical Industries Ld. .. .. .. .. —
Incandescent Heat Co. Ld. .. —
International Combustion Products Ld. .. .. —
International Construction Co. Ld. .. .. .. .. 37
International Harvester Co. of Great Britain Ld. .. —
Intrafor Mining Engineers Ld. —


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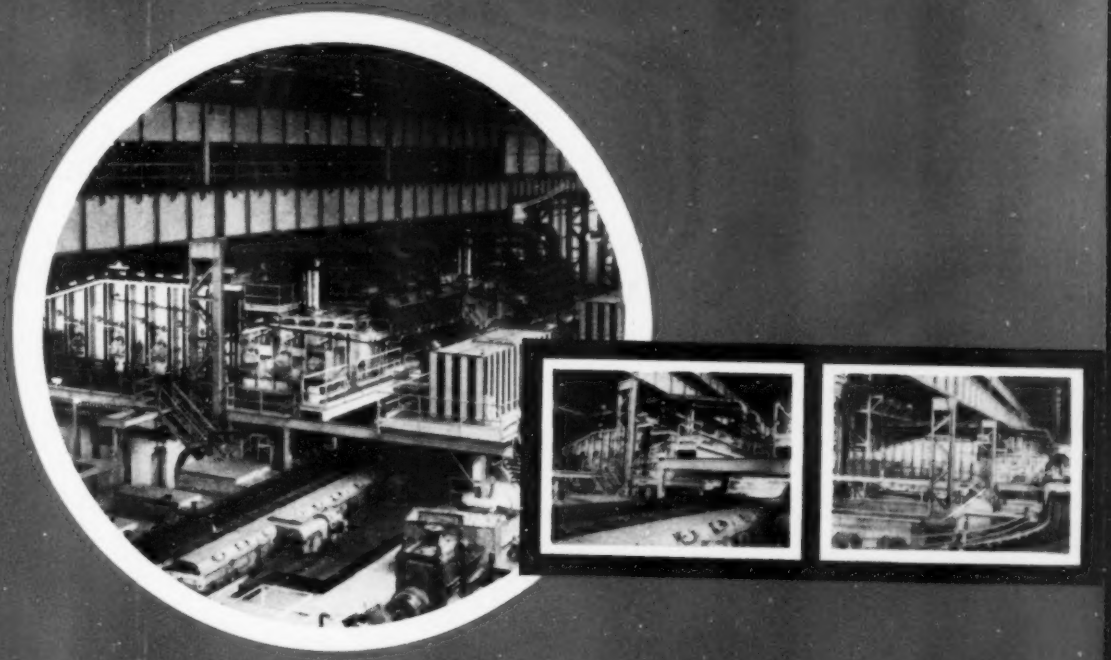

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We have recently commissioned two new Slab Reheating Furnaces which form part of John Summer's Strip Mill extensions. These furnaces, the largest in Europe, have replaced the three S & A Slab Reheaters which have heated approximately 12 million tons of steel since their completion in 1939. All Britain's wide Strip Mills are served by S & A Continuous Furnaces.

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FURNACE ENGINEERS

# IRON & COAL

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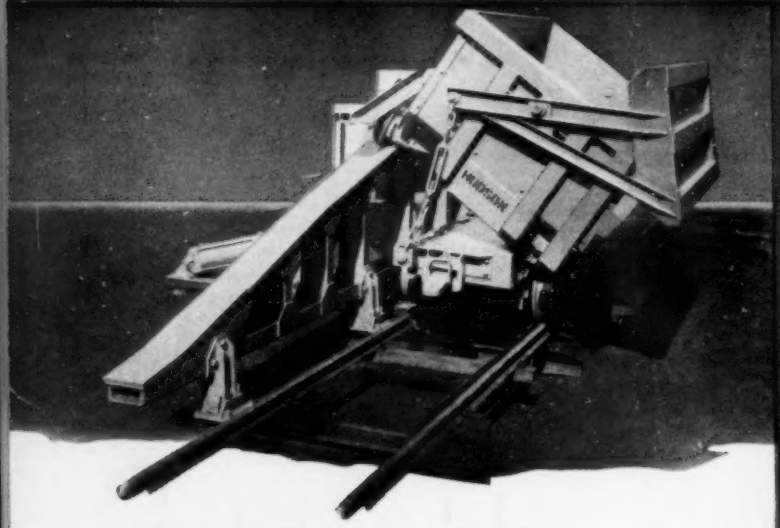
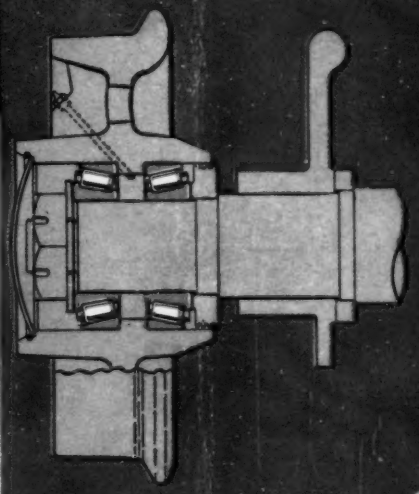


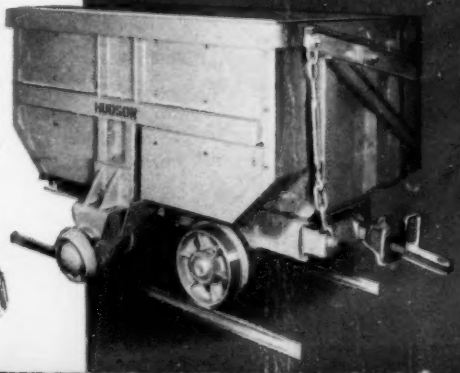

## SELF-DUMPING MINE CARS

The Granby mine cars, made by Robert Hudson Limited of Leeds, are of rugged construction to withstand the hard service to which they are subjected. Recent types supplied to Canadian uranium mines include the 60 cu. ft. capacity type shown here: this car has a tare weight of approximately 2 tons and a designed capacity of about 3 tons. Rubber suspension springs are provided.

The spherically-contoured wheel, visible on the left of the truck, engages a ramp and tips the truck whilst in motion. Furthermore, as shown in the illustration, the ramp can be retracted when tipping is not required. This wheel and all the track wheels of the 60 cu. ft. and 140 cu. ft. Granby trucks are mounted upon Timken bearings.

British Timken, Duston, Northampton, Division of The Timken Roller Bearing Company. Timken bearings manufactured in England, Australia, Brazil, Canada, France and U.S.A.



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